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1996

EPA Superfund
Record of Decision:

LOWER ECORSE CREEK DUMP
EPA ID: MID985574227
OU 01
WYANDOTTE, MI
07/17/1996

<IMG SRC 05963040>

Declaration
Selected Remedial Alternative
for the
Lower Ecorse Creek Site
Wyandotte, Michigan

Site Name and Location

Lower Ecorse Creek Site
North Drive
Wyandotte, Michigan 48192

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Lower Ecorse Creek site, in Wyandotte, Michigan, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis tor selecting the remedy for this site. The information supporting this remedial action decision is contained in the administrative record for this site. The State of Michigan is expected to concur on the selected remedy.

Assessment of the site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

The selected remedy is the final remedy for the site. The remedy addresses the threats posed by principal threat wastes at the site. Principal threat wastes are defined as those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present significant risk to human health or the environment should exposure occur.

The major components of the selected remedy include the following:

- Excavation and disposal of shallow and deep contaminated soil;
- Resampling of locations identified in the Remedial Investigation which showed contaminant levels above cleanup standards to determine the extent of contamination, and,
- Restoration of residential areas affected by excavation

Declaration of Statutory Determinations

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy does not satisfy the statutory preference for remedies that reduce the toxicity, mobility, or volume as a principal element because treatment of the principal threats of the Site was not found to be practicable: it would not be cost effective to treat such a small volume of waste, and the residential nature of the site precludes on-site treatment. However, if the waste is found to be characteristically hazardous, it will be required to be treated prior to final disposal, and the remedy will then satisfy the preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because this remedy will not result in hazardous substances remaining on-site above health-based levels, the five year review will not apply to this action.

< IMG SRC 0596304A>

State of Michigan: Letter of Concurrence

< IMG SRC 0596304B>

August 26, 1996

Mr. William E. Muno, S-6J
Director, Superfund Division
U S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Mr. Muno:

The Michigan Department of Environmental Quality (MDEQ), on behalf of the state of Michigan, has reviewed the proposed Record of Decision (ROD) dated June 19, 1996, for the Lower Ecorse Creek Superfund site in Wayne County, Michigan. We are pleased to inform you that we concur with the remedy outlined in the ROD.

This remedy meets state cleanup requirements, including the generic residential cleanup criteria, pursuant to Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (formerly known as the Michigan Environmental Response Act), and is expected to allow for unrestricted use of the site upon completion of the excavation.

The MDEQ looks forward to the successful completion of the final remedy for the Lower Ecorse Creek Superfund site. If you have any questions, please contact Mr. Brady Boyce, Superfund Section, Environmental Response Division, at 517-373-4824, or you may contact me.

Sincerely

<IMG SRC 0596304C>

Russell J. Harding
Director
517-373-7917

cc: Mr.   RMW, EPA
Mr. Alan J. Howard, MDEQ
Mr. Ardon Toland, MDEQ
Dr. George Carpenter, MDEQ
Mr. Brady Boyce, MDEQ/Lower Ecorse Creek File (GU)

Decision Summary for the Record of Decision

1.0 Site Name, Location, and Description

The Lower Ecorse Creek (LEC) Site is located in Section 17, R11E, T3SN in the City of Wyandotte, Wayne County, Michigan (Figure 1). The City of Wyandotte is located about 6 miles southwest of the City of Detroit. The site area includes six residential blocks centered around the 400 block of North Drive. The Detroit and Toledo Railroad tracks are located east of the residential area. The Ecorse River borders the site to the north and west. Directly north of the Ecorse River are the Dowriniver Communities Combined Sewer Overflow Treatment Plant and the abandoned Great Lakes Steel Foundry. Two lots located at 2303 Oak Street are also included as part of the site (Figure 2). The Oak Street Site is located approximately 1.5 miles west-northwest of the North Drive properties and the comer of 23rd Avenue and Oak Street.

2.0 Site History and Enforcement Activities

Before 1930, land near the banks of the Ecorse River in Wyandotte was wetlands. A 1937 aerial photograph shows the wetlands and a small brook that flowed to the river in the lots between Lots 23/24 (470/480 North Drive) and Lot 27 (446 North Drive). A 1951 photograph indicates that most of the wetland area had been filled, and residential development along North Drive had occurred.

By 1957 the river had been rechanneled. The confluence of the north and south branches of the river (also known as Upper and Lower Ecorse Creeks) was relocated from north of Lot 43 (304 North Drive). Extensive fill is evident north of the Ecorse River. Modifications to the river in the early 1980s involved straightening the south bank of the river at the rear of several residential properties in the area, reportedly using construction debris as fill. Interviews with local residents indicate that the homes on North Drive were built from about the 1920s through the 1980s.

In October 1989, the owner of the residence at 470/480 North Drive (Lots 23/24) reported to the Wayne County Health Department (WCHD) that workers excavating to replace the driveway on their property had encountered blue-colored soil. Preliminary tests by WCHD found high concentrations of cyanide in the blue-colored soil. WCHD consulted with the Agency for Toxic Substances and Disease Registry (ATSDR), and the agencies contacted U.S. EPA for further investigation. The U.S. EPA found that a large area of sod in the site area was colored a deep blue. The primary constituent of the coloring agent is ferric ferrocyanide. It is suspected that waste from a coal-gasification plant deposited in the site area is the probable source for the blue material found on the site. Blue-colored water was observed in the basement sump of the house at Lots 23/24. Blue stains also were seen on the basement walls of this house.

The ATSDR issued health consultations on the site in November 1989, July 1990, November 1990, and March 1991. In these consultations, ATSDR concluded that the site posed a significant health threat and recommended that residents avoid contact with contaminated areas until permanent measures could be completed.

In December 1989, the U.S. EPA covered the areas of visible contamination at the site with six inches of clean topsoil, to provide a temporary cover while further investigation went on and a permanent solution was developed. After it was reported that the new soil was eroding away, additional soil was added to the cover in August 1991. In January, 1993, the owner of the residence at Lots 23/24 reported that his basement had flooded with blue-colored water. U.S. EPA investigators found that these waters contained high concentrations of cyanide.

On August 13, 1993, the ATSDR issued a Public Health Advisory for the North Drive (Lower Ecorse Creek) site. The Advisory concluded that the levels of cyanide found in the soil at the site pose a significant public health hazard and that anyone using shallow groundwater in the site area may be at risk of exposure to cyanide contaminated water. The Advisory made the following recommendations:

1. Residents of the site area should be dissociated from the cyanide contamination;

2. Permanent remedial measures should be implemented as soon as possible;

3. The site should be considered for U.S. EPA's National Priorities List;

4. Residents in the area should be surveyed to locate any private wells in the site area;

5. Restrictions on digging in the site area should be considered; and,

6. The ATSDR Division of Health Studies should evaluate reports of adverse health effects to determine the source of these effects.

In November 1993, the U.S. EPA began a time-critical removal action at the site. This action included sampling 10 residential lots on North Drive for cyanide and other selected contaminants to delineate the area of contamination. Based upon those sampling results- contaminated soils from around the residence at Lots 23/24 and Lots 91/92 were removed and disposed of off-site. The foundations at both residences were also found to be deteriorated by the acidic nature of the waste. Repairs were made by U.S. EPA to both foundations. At Lots 23/24 application of a chemical resistant sealant to the basement walls and floors at the residence, and restoration of the surface drainage at the residence were also required. A U.S. EPA contractor had completed the excavation of contaminated soil around the residence and backfilIed the area with clean soil by January 1994.

On January 19, 1994, the Lower Ecorse Creek site was proposed for listing on the National Priorities List (NPL) based upon the ATSDR Public Health Advisory. It became final on the NPL on May 31, 1994.

In March 1995, an area of apparent cyanide contamination, similar to the material identified at North Drive, was discovered at the residential lot at 2303 Oak Street in Wyandotte, Michigan. A time-critical removal action was initiated and contaminated soil was excavated and disposed of and the site was restored in May 1995 Because of the apparent sirn~arity of the material to that found at the LEC site, the Oak Street site was included in the remedial investigation and feasibility study for the LEC site.

On December 22, 1993 U.S. EPA issued General Notice letters to BASF Corporation and Michigan Consolidated Gas Company, offering them the opportunity to undertake the RI/FS for the site. Both parties refused to undertake the work and on March 14, 1994 a flind-financed RI/FS began. The final RI report was released to the public in February 1996. The final FS report was released to the public on April 15, 1996.

On November 29, 1995, ATSDR released a final Public Health Assessment for the site which stated that the recommendations made in the 1993 Public Health Advisory concerning the site have been addressed as follows:

1. Residents of the site area should be dissociated from the cyanide contamination- U.S. EPA carried out an Emergency Removal Action in Late 1993 and early 1994 at the site. Contaminated surface soil was removed and the walls and floor of the basement of the house at the center of the contaminated area were sealed to keep contaminated groundwater out;

2. Permanent remedial measures should be implemented as soon as possible - The removal of contaminated sod in the 1993 U.S. EPA Emergency Removal Action is a permanent remedial measure. Permanent measures to remedy the contamination of the groundwater have not been implemented. Although groundwater is not used in the site vicinity, residents and visitors may be exposed to the water through seepage into basements in the site area;

3. The site should be considered for U.S. EPA's National Priorities List - U.S. EPA placed the site on the NPL in January 1994;

4. Residents of the site area should be surveyed to locate private wells in the site area - No private wells were identified in the immediate area surrounding the site. All households are connected to municipally supplied water;

5. Restrictions on digging in the site area should be considered - U.S. EPA has advised residents of the site area not to dig in their yards; and,

6. The ATSDR Division of Health Studies should evaluate reports of adverse health effects to determine the source of these effects - ATSDR and U.S. EPA evaluations of the health problems experienced by one young resident of the site area have not identified a connection between these effects and his potential exposure to the cyanide compounds in the soil, air, and groundwater at his home.

3.0 Highlights of Community Participation

The Responsiveness Summary in Section 12.0 discusses the involvement of the community during the RI/FS and remedy selection process and shows that the public participation requirements of CERCLA Sections 113(k)(2)(I-v) and 117 of CERCLA have been met at this site. The decision is based on the Administrative Record.

4.0 Scope and Role of Operable Unit-or Response-Action Within Site Strategy

This Record of Decision (ROD) addresses the final remedy for the site. The threats posed by this site to human health and the environment are primarily from cyanide contaminated soil. Other contaminants are present, e.g. SVOC's, however, they do not pose an unacceptable risk.

The contaminated soil is the source materials for contamination at the site and are classified as principal threat waste. Principal threat wastes are considered to be those source materials that are highly toxic or highly mobile that generally cannot be reliably contained or would present significant risk to human health or the environment should exposure occur.

4.1 Site Physical Characteristics

4.1.1 Topography

The LEC site is located in a former wetland area of the Ecorse River. The site consists of a developed residential area consisting of flat lying residential lots. Development of the residential area required filling in the former wetlands and later straightening the south bank of the Ecorse River.

4.1.2 Geology

Site geology primarily consists of fill soils and wetland and native fluvial deposits from the Ecorse River overlying lacustrine clays. Fill was historically used to develop wetland areas into a residential area along North Drive. The fill consists of construction debris, natural clay fill materials, and waste materials.

Native soils beneath the fill consist of gray to orange brown, finely layered, fine to very fine sand, silt, and clay. Native surficial soils appear to have been reworked, possibly during the construction of the residences.

4.1.3 Hydrology

The site is bounded on the north and west by the Ecorse River. The Ecorse River flows to the east and discharges into the Detroit River about 200 feet from the eastern site boundary. The area north of North Drive lies in the river's designated 100-year floodplain (see Figure 3).

Runoff from the northern portions of the residential lots on North Drive flows into the Ecorse River. The runoff from the remaining residential lots flows into the streets and storm sewers. The storm sewers carry the runoff to the local treatment plant, from where it is discharged into the river

4.1.4 Hydrogeology

Whether groundwater is present in clay rich terrain such as in eastern Wayne County depends on the occurrence of glaciofluvial deposits. Limited quantities of groundwater may be found in these permeable localized sand and gravel bodies that are buried within the lake plain deposits. The frequency and occurrence of these discontinuous sand and gravel bodies decreases toward the Detroit River (Mozola 1969).

Groundwater was not detected in most of the borings completed throughout the study area. Groundwater occurred in the borings only in thin permeable zones consisting of coarse fill debris and soft wetland soils. Primarily these localized isolated zones occurred within the fill near the river.

Deep borings drilled outside of fill areas for stratigraphic profiling indicated moist to wet soils only in wetland soils. This perched water yielded very small quantities of water and did not prove to be laterally extensive.

5.0 Summary of RI Findings and Previous Investigation Results

The U.S. EPA assigned CH2M HILL to perform an RI for the LEC and Oak Street sites. CH2M HILL developed and implemented an investigative approach that evaluated the nature and extent of contaminants in site soils, perched groundwater, surface water and sediment, and residential air, sump water, and sump sediment. Field activities were conducted from November 14 to December 22, 1994. Only surface and subsurface soils were investigated at the Oak Street properties. The findings of the RI conducted in the residential areas and those in the previous investigation area are summarized below. Tables 1 through 29 summarize the analytical results for each of the media tested. The area of previous investigation, is defined as those lots sampled during the removal action at this site (see Figure 1).

5.1 Nature and Extent of Contamination

5.1.1 LEC Soils

Background soil samples were collected in the residential areas adjacent to the LEC site and background concentrations were calculated according the MDEQ guidance document, Verification of Soil Remediation, 1994 (the mean plus 3 standard deviations). In the discussion, surface soils are assumed to be from 0 to 2-feet below ground surface and subsurface soils from 2 to approximately 17 feet below ground surface. This is consistent with the distinctions made between surface and subsurface soils to calculate risks in the baseline risk assessment.

In the area of the previous investigation, cyanide was detected in 73 percent of the surface soils at a maximum reported concentration of 1,730 mg/kg. Cyanide was also detected in the subsurface soils in most of the samples collected during the RI from the area of previous investigation at a maximum concentration of 32,300 mg/kg at a depth of 4 to 6 feet. The maximum cyanide concentration in the soil samples collected from the area outside the previous investigation area was 4.0 mg/kg, measured in a surface soil sample.

Antimony, barium, chromium, copper, iron, lead, manganese, and zinc were the metals detected most frequently at concentrations greater than background in both surface and subsurface soils at the site. Metals were detected above background most frequently -in the fill area adjacent to the Ecorse River.

As expected when analyzing for volatile organic compounds (VOCs) in a medium in close proximity to the open atmosphere, the majority of surface soils did not contain any detectable VOCs. Methylene chloride and acetone were the VOCs detected most frequently in surface soils at the site Methylene chloride was detected at a maximum concentration of 19 :g/kg, and acetone was detected at a maximum concentration of 76 :g/kg,. Methylene chloride, acetone, carbon disulfide, and 2-butanone were the VOCs detected in the subsurface soils with the greatest frequency at maximum concentrations of 260; 1,3005 65,000 and 196 :g/kg, respectively.

Polynuclear aromatic hydrocarbons (PNAs) were detected across the site in both surface and subsurface soils. The maximum concentration of an individual PNA measured was 150,000 :g/kg for pyrene. PNAs were detected in the highest concentrations in the area of previous investigation and the northeast lot. Dioxin was found in soils at 10 site locations, primarily in the playground/park area at a maximum concentration of 16.0 ng/g. Two surface soil and two subsurface soil samples contained polychlorinated biphenyls.(PCBs). The maximum PCB concentration was 250 :g/kg in a subsurface sod sample from the playground/park area.

Figure 4 shows the sampling locations where contaminants exceeded MDEQ cleanup standards.

5.1.2 Oak Street Site

At the Oak Street site, cyanide was detected in subsurface soils at concentrations ranging from 44.1 to 7,438 mg/kg. The highest concentrations were found the west area, adjacent to the asphalt parking lot. PAHs and other metals, similar to the ones detected at the North Drive area were also detected at the Oak Street Site.

5.1.3 Perched Groundwater

Low concentrations of VOCs and semivolatile organic compounds (SVOCs) (1 to 3 :g/kg) were detected in one perched groundwater sample from the playground/park area. Metals detected in the perched groundwater samples did not exceed background levels.

5.1.4 Surface Water and Sediment

Surface water and sediment samples were collected both upstream and adjacent to the Site. VOCs (1 to 15 :g/L) were detected in four surface water samples. No SVOCs were detected in the surface water samples. Several inorganic analytes, including arsenic, barium, chromium, copper, lead, cyanide, zinc, and cadmium, were found in surface water samples. Low concentrations of acetone (less than 92 :g/kg) and xylene (less than 10 :g/kg) were identified in four sediment samples. SVOCs (19,760 :g/kg total SVOCs) were detected at SD-02. Several metals, including cyanide, lead, and zinc, were detected in sediment at concentrations that exceed background sediment levels.

5.1.5 Residential Air, Sump Water, and Sump Sediment

No hydrogen cyanide was detected in the six air samples collected in the residential basements. Low concentrations of carbon disulfide and acetone were detected in one sump water sample (0.6 :g/L) and one sump sediment sample (14 :g/kg), respectively. Low concentrations of PNAs, phthalates, and phenols were detected in two sump water samples. Inorganic analytes. were detected in both sump water and sediment samples, with the highest concentrations found in the sample collected from the basement sump of the residence in the area of previous investigation.

5.1.6 Contaminant Fate and Transport

In general, contaminants in surface and subsurface soils have been identified during the RI in the highest concentrations in the area of previous investigation and in pockets of contaminated fill along the Ecorse River including the playground/park area, the northeast lot, and the north bank area (see Figure 1). The primary contaminant release and transport mechanisms from the LEC site consist of:

- Erosion, transport, and deposition of contaminated dust by wind

- Leaching of dissolved contaminants into perched groundwater and transport in groundwater to discharge areas such as the Ecorse River or potentially into residential basements by seepage through basement walls

- Surface runoff of dissolved contaminants to the Ecorse River or by soil erosion and particulate transport in surface water

- Volatilization of VOCs from the soil and migration offsite through the atmosphere, and possibly into basements.

The main contaminants at the site, Including PNAs, cyanide in the form of ferric ferrocyanide, and metals, tend to be persistent in the environment because they (PNAs) are slow to degrade and have low mobility.

Contaminants at the site are not expected to migrate a great distance from the source areas. Because there does not appear to be continuous groundwater unit at the site and because the perched groundwater identified is of limited aerial extent and depth, the groundwater pathway for contaminant migration is not considered to be significant. The primary migration pathways at the site are through the air and surface water run-off.

6.0 Risk Assessment

Pursuant to the National Contingency Plan (NCP) a baseline risk assessment was performed using analytical data generated during the RI and the removal project. The baseline risk assessment assumes no corrective action will take place and that no site-use restrictions or institutional controls such as fencing, groundwater use restrictions or construction restrictions will be imposed. However, for the future site scenarios, present action at the site and current plans for development are considered. The risk assessment determines actual or potential carcinogenic risks and/or toxic effects the chemical contaminants at the site pose under current and future land use assumptions using a four step process. The four step process includes: contaminant identification, health effects assessment, exposure assessment and risk assessment. Table 30 summarizes the results of the risk assessment.

6.1 Contaminant Identification

During the RI several chemicals in different media were detected and a list of "chemicals of potential concern" was developed using the following criteria:

- Any chemical detected at least once in any on-site soil, groundwater, surface water, or sediment sample was considered to be a possible chemical of concern;

- Several chemicals known to be essential for human nutrition were eliminated. These chemicals were present at levels that are considered non-toxic.

- Compounds that were detected at concentrations above the calculated background concentrations were retained as compounds of concern. According to RAGS Part A, most organic compounds found at remediation sites are not naturally-occurring, and thus cannot be eliminated from the quantitative assessment. The organic compounds detected were retained as compounds of concern.

The chemicals of potential concern are listed in Table 31.

6.2 Human Health Effects

The health effects for the contaminants of concern may be found in the RI report.

6.3 Exposure Assessment

The baseline risk assessment examined potential pathways of concern to human health under both current and future land-use scenarios for the immediate property and the surrounding area. The exposure scenarios which were evaluated in the baseline risk assessment were based on the residential land use that currently exists in the study area. It was also assumed also that the area would remain residential in the future. The residential land use scenario provided a conservative estimate of intakes, and therefore, risks.

The following pathways were selected for detailed evaluation under both the current and future land-use conditions:

- Residential adult and child exposure to surface and subsurface soil

- Residential adult and child exposure to surface water and sediment in the Ecorse River

- Adult exposure to sump water and sump sediment

The current and future site uses are expected to be residential. Exposure to soil was evaluated separately for the residential area and the playground/park area because the exposure assumptions for each of these areas were different. In addition, the risk to residents in the residential area was also evaluated separately for the area of previous investigation (for cyanide) and the rest of the residential area. Potential, human health impacts from exposure to surface soil, subsurface soil, surface water and sediments, and sump water and sediments are presented below.

6.4 Risk Characterization

For each potential human receptor, site-specific contaminants from all of the relevant routes of exposure were evaluated. Both non-carcinogenic and carcinogenic health effects were estimated.

Reference doses (RfDs) have been developed by U.S.EPA as a means of identifying the potential for adverse health effects from exposure to chemicals that typically exhibit non-carcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of average daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media (e.g., the amount of chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e,g., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse non-carcinogenic effects to occur.

The Hazard Index (HI), an expression of non-carcinogenic toxic effects, measures whether a person is being exposed to adverse levels of non-carcinogens. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across multiple media. The HI for non-carcinogenic health risks is the sum of all contaminants for a given scenario. Any Hazard Index value greater than 1.0 suggests that a non-carcinogen potentially presents an unacceptable health risk.

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of (mg/kg-day) -1, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassay. The excess lifetime cancer risks are the sum of all excess cancer lifetime risks for all contaminants for a given scenario determined by multiplying the intake level by the cancer potency factor for each contaminant of concern.

6.4.1 Surface Soils

Potential inadvertent Ingestion and dermal absorption of contaminants detected in surface soils in the residential area resulted in estimated potential excess lifetime cancer risks of 9 x 10 -6 for reasonable maximum exposure (RME) adults and 1 x 10 -6 for RME children. The central tendencies exposure (CTE) cancer risk were estimated at 2 x 10 -7 for adults and 1 x 10 -6 for children. These cancer risks were due primarily to carcinogenic PNAs (Class B2 carcinogen) detected in residential area surface soils. Inhalation of VOCs and particulates resulted in estimated potential lifetime cancer risks of less than 1 x 10 -6 for both adults and children. Hazard indexes (HIs) due to exposure to surface soils for adults and children were less than 1.

The HIs for both adults and children with exposure to cyanide-containing surface soils from the area of previous investigation were less than 1. Because the adult and child RME His were less than 1, the CTE scenario was not evaluated.

Potential inadvertent ingestion of and dermal contact with contaminants detected in surface soil samples from the playground/park area resulted in estimated potential excess lifetime cancer risks of 1 x 10 -5 for RME adults and 3 x 10' for RME children. The estimated potential excess lifetime cancer risk for CTE adults was 6 x 10 -7 , and the excess lifetime cancer risk for CTE children was 5 x 10 -6 These cancer risks estimates were due primarily to the presence of arsenic (Class A carcinogen) in playground/park surface soils. Inadvertent ingestion of surface soils resulted in potential excess lifetime cancer risks of 6 x 10 -6 for

RME adults and 1 x 10 -5 for RME children; the excess lifetime cancer risk estimated for CTEs due to ingestion of soil was 4 x 10 -7 for the adult, and 5 x 10 -6 for the child. The majority of this risk was due to the presence of arsenic and PNAs. Dermal absorption of surface soil contaminants from the playground/park area also contributed substantially to the estimated cancer risks, with adult dermal exposure resulting in a cancer risk of 5 x 10 -6 (RME) and child dermal exposure resulting in a cancer risk of 2 x 10 -5 (RME). The cancer risk estimated for CTEs due to dermal contact was 2 x 10 -7 for the adult and 2 x 10 -7 for the child. Arsenic, PCBs, and PNAs in playground/park surface soils were the primary carcinogens for these risk estimates. Inhalation of surface soil contaminants resulted in estimated potential lifetime cancer risks well below 1 x 10 -6. HIs associated with exposure to playground/park surface soils were less than 1 for adults and children.

6.4.2 Subsurface Soils

Future potential inadvertent ingestion of contaminants detected in residential area subsurface soils resulted in estimated potential excess lifetime cancer risks of 5 x 10 -6 for RME adults and 1 x 10 -5 for RME children. The estimated potential excess lifetime cancer risk for CTE adults was 2 x 10 -7, and the estimated potential excess lifetime cancer risk for CTE children was 4 x 10 -6. The cancer risk was due to the presence of PNAs. This risk was caused by the ingestion of contaminated subsurface soils; the risk due to inhalation of contaminated subsurface soils was below 1 x 10 -6 Dermal risks for PNAs, although not calculated, should be assumed to be of the same order of magnitude as those calculated for ingestion. HIs for subsurface soil exposures were less than 1 for adults and children.

The presence of cyanide at a concentration of 32,300 mg/kg in subsurface soils in the area of previous investigation (hot-spot) resulted in an HI estimate greater than 1 for RME children, indicating the potential for noncancer adverse health impacts. The RME HI was due to ingestion of contaminated subsurface soils in this area (2.1 for children), with dermal exposure contributing a much smaller portion (0.2 for children). The HI for RME adults was less than 1. The CTE adult and child HIs were less than 1.

6.4.3 Surface Water and Sediment

Exposure to surface water and sediments resulted in estimated potential excess lifetime cancer risks below 1 x 10 -6, HIs. associated with ingestion and dermal exposures were less than 1. Because RME risks were below 1 x 10 -6 (and HIs were less than 1), the CTE scenario was not evaluated.

6.4.4 Sump Water and Sediments

Dermal contact with sump water by adults resulted in an estimated potential excess lifetime cancer risk below 1 x 10 -6, as did contact with sump sediments. The HIs associated with dermal contact with sump water and sump sediments were both less than 1. Because RME risks were below 1 x 10 -6 (and HIs were less than 1), the CTE scenario was not evaluated In an assessment of the risks to household pets from ingestion of sump water there were no unacceptable risks found. For a full explanation of the household pet risk evaluation please see the June 13, 1996, memorandum from CH2M Hill, which is in the administrative record.
The risk to a household cat was evaluated assuming both a one year and 14 year exposure duration with a consumption of 0.3 liter/day. A comparison of the intake and the oral toxicity value for each chemical of concern showed no unacceptable risk.

6.4.5 Acidic and Basic Soils

Due to the nature of soils in the area, a qualitative evaluation of the risks due to exposure to acidic or basic soils was also conducted. Acidic or basic soils at the site are found at the site in the areas of high cyanide concentrations. Exposure to acids can result in severe skin burns, usually with a dry crust from coagulation necrosis. Alkalies (bases) produce softer burns, which can be extremely painful. Acid bums to the eye are a dual function of the pH and the capacity of the acid's anion to combine with ocular proteins (in addition to other aspects, such as the defatting action by sulfuric acid and sulfur dioxide). The effects noted above for exposure to acidic or basic solutions may or may not occur upon exposure to soils. The effects may vary in seventy depending on the matrix of the acid or base (solution vs. soil) and the physical condition of the skin or eye (thickness, presence of cuts or abrasions, etc.). Aside from the acidic or basic nature of soil, the physical abrasive action of soils would damage the skin or the eyes. The chemical action of acidic or basic soils is likely to have a greater impact on physical structures, such as foundations, due to their continuous and long-term contact with the soils and weathering effects (freeze-thaw).

6.4.6 Ecological Risk Assessment (ERA)

The purpose of the ERA is to evaluate the potential adverse ecological effects that may be or are occurring as a result of exposure to site-related stressors at the LEC site. The ERA evaluates potential threats to ecological receptors in the absence of any remedial actions.

6.4.6.1 Aquatic Communities

The greatest risk posed by contaminants associated with the LEC Site appears to be from contaminants within sediments of Lower Ecorse Creek. However, the contaminants associated with the site and found in the sediments were also detected upstream from the site indicating that the site is not the source of the contamination problem in the creek. The habitat associated with the creek itself already precludes the existence of a diverse and sustainable population of aquatic organisms. Even though the habitat quality is questionable, exposure and risk to aquatic organisms was evaluated by comparing exposure dose estimates to National Ambient Water Quality Criteria (NAWQC)standards or literature-based benchmark value. Aluminum, barium, lead, iron, anthracene, and benzo(a)anthracene are present and are of the greatest concern to aquatic organisms based on the dose estimate comparisons. The NAWQC and sediment benchmark values were considered conservative. Therefore, the actual affect on the aquatic ecosystem may not be as great as indicated by the dose estimate comparisons.

6.4.6.2 Terrestrial Communities

The contaminants associated with surface soils that pose a potential threat to terrestrial communities associated with the LEC Site were lead and cyanide. Even though the residential setting does not support a diverse community structure, the level of cyanide in the soil may be of significant threat to birds such as robins. It should be noted here that several COCs were not evaluated relative to effects on terrestrial communities because there is limited toxicological information available.

6.5 Rationale for Further Action

Actual or threatened releases of hazardous substances from this site, if not addressed by implementation of the response action selected by this ROD, may present an imminent and substantial endangerment to the public health, welfare or the environment. Therefore, based upon the findings of the RI report and the discussion above, a Feasibility Study (FS) was performed to focus the development of alternatives to address the threats at the site. The FS report documents the evaluation of the magnitude of the site risks, site-specific applicable or relevant and appropriate requirements, and the requirements of CERCLA and the NCP in the derivation of remedial alternatives for the LEC site.

7.0 Description of Alternatives

Three alternatives for the remediation of soils at the LEC site were developed including a no action alternative. These alternatives include all the remedial technologies remaining after screening that are applicable to inorganic and SVOC contamination. The alternatives are:

Alternative 1-No action

Alternative 2-Excavation and disposal of shallow contaminated soil and implementation of institutional controls for areas of deep contaminated soil

Alternative 3-Excavation and offsite treatment and disposal of shallow and deep contaminated soil

7.1 Alternative 1-No Action

Capital Cost:	None
Annual Operation and Maintenance Cost	None
Present Worth	None
Time to Implement	None

The no action alternative is required by the NCP. Its purpose is to allow comparison of alternatives to the conditions that currently exist and that would exist in the future. Under Alternative 1 there would be no remediation of the contaminated soils. There would be no ongoing site security or installation of a site fence. No restrictions would be placed on sale of the property or future development of the site.

7.2 Alternative 2-Excavation and Disposal of Shallow Contaminated Soils and Institutional Controls for Deep Contaminated Soils

Capital Cost	$894,150
Operation and Maintenance Cost	None
Present Worth	$894,150
Time to Implement	6 months from start of construction

The major components of Alternative 2 are:

- Excavation of shallow contaminated soil
- Disposal of shallow contaminated soil
- Implementation of institutional controls for deep contaminated soil
- Restoration of residential areas

The objective of Alternative 2 is to protect human health and the environment from unacceptable risk associated with direct contact with the soils through the use of a combination of excavation, disposal, and deed restrictions.

At the location where contaminated soils were detected in the 0 - 2 foot depth range, those locations would be excavated to 1 foot below the level of contaminated soil using standard excavation equipment such as backhoes, front-end loaders, and bulldozers. Since the soils to be excavated are located on the property of private residences, small excavation equipment and tools for hand digging will also be required. Trucks used for loading of the excavated soils would be direct-loaded, and stockpiling of soil would be minimized. Excavation would proceed downward and outward from the centers of the known areas of contamination. Assuming an area of 10 feet by 10 feet and a depth of 2 foot deeper than the level of contamination, the amount of inorganic- and SVOC -contaminated shallow soil to be excavated and disposed of offsite at a landfill is estimated to be 298 cubic yards. This total is an estimate and is subject to increase if confirmatory sampling indicates that additional soil removal is necessary. Further sampling will be performed in areas that have been designated for remediation and which are located on private property and appear to be isolated areas of contamination. This additional sampling will confirm the RI sampling results and delineate areas of contaminated soil so that property owners will know if excavation is required and, if so, how much of their property will be by excavation before remedial activities on their property begin.

7.3 Alternative 3-Excavation and Disposal of Shallow and Deep Soil

Capital Cost	$645,800
Annual Operation and Maintenance Cost	None
Present Worth	$645,800
Time to Implement	3 months from start of construction

The major components of Alternative 3 are:

- Delineation of isolated contaminated soil on private property
- Excavation of shallow and deep contaminated soil
- Disposal of shallow and deep contaminated soil
- Restoration of residential areas

Alternative 3 would eliminate the need for institutional controls because all contaminated soils with concentrations of COCs above the remedial goals established for the site, and the unacceptable health risks associated with them, would be removed from the site. Shallow and deep contaminated soils would be removed using procedures discussed for Alternative 2. At locations where R1 data indicate that only the deep soils are contaminated, soils above the zone of contamination would be stockpiled in a clean area to be used later as backfill after confirmatory sampling is completed. Contaminated soil would be excavated. The amount of inorganic- and SVOC-contaminated soil to be excavated and disposed of offsite at a landfill is estimated to be 906 cubic yards. The total is an estimate, confirmatory sampling will be necessary to determine the actual extent of contamination.

Further sampling will be performed in areas that have been designated for remediation and which are located on private property and appear to be isolated areas of contamination. This additional sampling will confirm the RI sampling results and delinate areas of contaminated soil so that property owners will know if excavation is required and, if so, how much of their property will be impacted by excavation before remedial activities on their property begin.

8.0 Summary of Comparative Analysis of Alternatives

The relative performance of each remedial alternative was evaluated in the FS and below using the nine criteria set forth in Title 40 of the Code of Federal Regulations (40 CFR) Section 300.430 of the NCP An alternative providing the "best balance" of trade-offs with respect to the nine criteria is determined from this evaluation.

8.1 Threshold Criteria

The following two threshold criteria, overall protection of human health and the environment, and compliance with Applicable or Relevant and Appropriate Requirements (ARARs) are criteria that must be met in order for an alternative to be selected.

8.1.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether a remedy eliminates, reduces, or controls threats to human health and to the environment.

Alternative 1, no action, does not provide overall protection to human health and the environment. Direct contact with contaminated soils can still occur.

Alternatives 2 and 3 protect human health and the environment by removing or treating contaminated soil from the LEC and Oak Street sites. These alternatives, however, increase short-term risks onsite during the excavation and consolidation of soil and the protectiveness offsite would rely on the integrity of the offsite landfill.

Alternative 3 protects human health and the environment by removing and treating contaminated soils. Alternative 2 also protects human health and the environment to some degree by removal of shallow contaminated soil; however, this alternative provides no protection from the deep soils with concentrations exceeding cleanup standards, therefore, institutional controls would be required. The protectiveness provided by the offsite disposal facility would rely on the effectiveness of the stabilization/solidification process. Short-term risks are elevated onsite for workers and the community during the excavation and treatment of contaminated soils.

Alternatives 2 and 3 are both protective of human health and the environment because direct exposure from contaminated soil would be prevented as long as exposure to deep contaminated soil is prevented under Alternative 2.

8.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

Alternative 1 does not comply with federal or state promulgated standards such as those specified in Michigan Act 451, Part 201. Alternative 2 would not reduce the risks from the deep contaminated soils that were identified in the risk assessment and the release and transport mechanisms would remain unchanged. Alternative 3 would reduce site-related risks and would comply with all ARARs if the required permits are obtained.

8.2 Primary Balancing Criteria

8.2.1 Long-Term Effectiveness and Permanence

This criterion refers to the expected residual risk and the ability of an alternative to maintain reliable protection of human health and the environment over time once clean up levels have been met.

Alternative 1, no action, would not provide long-term effectiveness. Exposure and risks resulting from current conditions at the site would continue.

Alternatives 2 and 3 provide long-term effectiveness at the site by permanently removing or treating contaminated soils that are above cleanup standards. Alternative 2 does not provide as much long-term protectiveness because the deep contaminated soils would still be in place. The SVOC COCs at the LEC site are, however, relatively immobile. The contaminated sod disposed of offsite would be controlled by measures taken at the disposal facilities. With present regulations on designing, constructing, and operating disposal facilities, long-term effectiveness would be expected.

Alternatives 2 and 3 are protective, however, Alternative 3 is more protective because both the shallow and deep soil are removed and additionally controlled by the stabilization/solidification process. Inorganic chemicals can be stabilized in the long term because they are chemically stabilized within the cement and the SVOCs are physically solidified within the mass of concrete, reducing the mobility of the SVOCs. Although soils contaminated with SVOCs and inorganic cherruicals would remain onsite in Alternative 2, the potential for direct exposure would be reduced by the enforcement of deed restrictions. These are meant to prevent activities that involve exposure of the deep contaminated soils.

8.2.2 Reduction of Toxicity, Mobility, or Volume through Treatment

In Alternative 1, no action, toxicity and volume of the contaminants would not change. While the mobility of the COCs will not change, they may be transported to uncontaminated areas by water erosion of the soil and infiltration.

In Alternatives 2 and 3, while there are no reductions in the toxicity and mobility of the COCs, risks to the community associated with the toxicity and mobility of the COCs are reduced when the contaminated material is disposed of or treated offsite. The offsite disposal or treatment facility would have measures in place to control the toxicity and mobility of the COCs brought from the site. Both Alternatives 2 and 3 are effective at reducing migration through the stabilization/solidification of excavated soils but would increase the volume of the excavated soil by approximately 120 percent by the addition of the stabilizing material. This increase in the volume of soil would not impact the site, however, since the stabilization/solidification process would be conducted offsite at the disposal facility.

8.2.3 Short-Term Effectiveness

Under Alternative 1, there would be no additional short-term risk to the community. Alternatives 2 and 3 create greater short-term risks to the community and onsite workers due to the excavation and disposal/treatment of contaminated soils. Alternative 2 will not create as much risk since only the shallow contaminated soil will be removed. Short-term risks can be reduced through common construction practices, such as using Level D personal protection. Compared to no action, Alternatives 2 and 3 create some potential for direct contact by residents living in the houses in the immediate vicinity of the work, with contaminated soil during excavation and disposal.

Some additional considerations are the noise generated and typical risks associated with the heavy equipment onsite. Heavy traffic caused by vehicles used for excavation and trucks for soil disposal and site restoration will also be associated with all Alternatives, except for the no action, alternative. Added risks are associated with this traffic since it will be in the midst of a residential area. RAs associated with Alternative 3 can be performed within 3 months of the start of construction; Alternative 2 may take longer since there may be time delays in obtaining deed restrictions for the individual residential properties.

8.2.4 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative, and the availability of vanious services and materials required for it implementation.

The technical feasibility of all alternatives is well understood. The technologies associated with Alterriatives 2 and 3 are straightforward and usually easy to implement, however, because the areas to be excavated are located in a residential area, implementation becomes complicated. Applying deed restrictions for Alternative 2 may be administratively difficult to implement.

Alternatives 2 and 3 are both technically feasible.

8.2.5 Cost

This criterion compares the capital, operation and maintenance (O&M), and present worth costs for implementing the alternatives at the site. Table 32 shows the cost summary.

Table 32
Alternative Cost Summary

	Capital Cost	O&M Cost	Present Worth
Alternative 1	None	None	None
Alternative 2	$894,150	None	$894,150
Alternative 3	$645,800	None	$645,800

8.3 Modifying Criteria

8.3.1 State Acceptance

State acceptance indicates whether, based on its review of the RI/FS, and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.

The State of Michigan has assisted in the development and review of the Administrative Record. The State's position regarding the selected alternative will be presented in a formal statement of concurrence, if appropriate. The State is expected to concur on the remedy.

8.3.2 Community Acceptance

The specific public comments received and U.S. EPA's responses are outlined in the attached Responsiveness Summary.

9.0 The Selected Remedy

Based upon considerations of the requirements of CERCLA, the NCP, and balancing of the nine criteria, the U.S. EPA has determined that Alternative 3, Excavation and Disposal of Shallow and Deep Contaminated Soil, is the most appropriate remedy for the site. The components of the selected remedy are described below.

The major components of the selected remedy are:

Delineation of isolated areas of contaminated soil on residential properties

Excavation of shallow and deep contaminated soil

Off-site disposal of shallow and deep contaminated soil

Restoration of properties affected by the remediation

9.1 Delineation of Isolated Contaminated Soil on Private Property

Further sampling will be performed in areas that have been designated for remediation, are located on private property and appear to be isolated areas of contan-driation. This additional sampling will confirm the RI sampling results and delineate areas of contaminated soil so that property owners will know if excavation is required and, if so, how much of their property will be impacted by excavation before remedial activities on their property begin.

9.2 Excavation of Contaminated Soil

Shallow and deep soils, with contaminants above the cleanup standards set forth in Table 33 would be excavated and disposed of off-site at an approved disposal facility. At locations where RI data indicate that only the deep soils are contaminated, soils above the zone of contamination would be stockpiled in a clean area to be used later as backfill after confirmatory sampling is completed.
Contaminated soil would be excavated.

Upon removal of the contaminated soil, soil samples would be collected from the bottom and perimeter of the excavation to verify that soils with concentration levels above the PRGs have been removed. Following excavation, the hole would be backfilled using uncontaminated soil.

9.3 Disposal at a Landfill

The excavated soil contaminated above the cleanup standards would be transported to a Subtitle D landfill for disposal. Testing for RCRA hazardous waste characteristics would be performed, and if necessary, the soil would be stabilized off-site to meet the disposal facility's requirements prior to landfilling.

9.4 Restoration of Residential Areas

Excavation around private residences could require removal of sidewalks, lawns and other vegetation. Areas affected by the remediation will be restored, as close as practicable to their existing condition (including trees and shrubs).

10.0 Statutory Determinations

U.S. EPA's primary responsibility at Superfund Sites is to undertake remedial actions that protect human health and the environment. Section 121 of CERCLA has established several statutory requirements and preferences. These include the requirement that the selected remedy, when completed, must comply with all applicable, relevant and appropriate requirements ("ARARs") of Federal and State environmental laws, unless the invocation of a waiver is justified. The selected remedy must also provide overall effectiveness appropriate to its costs, and use permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable. Finally, the statute establishes a preference for remedies which employ treatment that significantly reduces the toxicity, mobility or volume of contaminants.

10.1 Protection of Human Health and the Environment

Implementation of the selected remedy will protect human health and the environment by reducing the risk of exposure to hazardous substances present in surface soils and subsurface soils at the Site. Excavation and off-site disposal of the contaminated soil will minimize the direct contact risk of exposure to hazardous substances present in soil at the Site. Additionally, it will minimize the risk of drainage waters carrying the contaminants, via the drainage systems, or cracks in the foundations into the basements of the homes on site. It will also minimize the possibility of the acidic or basic soils associated with the contamination from coming in contact with and damaging foundation walls or utility lines. No unacceptable short-term risks Will be caused by implementation of the remedy. The community and site workers may be exposed to dust and noise nuisances during excavation, however, mitigative measures will be taken during remedy construction activities to minimize such impacts of construction upon the surrounding community and environs. Ambient air monitoring will be conducted and appropriate safety measures will be taken if contaminants are emitted.

10.2 Compliance with ARARs

The selected remedy will comply with all identified applicable or relevant and appropriate federal requirements, and with those state requirements which are more stringent, unless a waiver is invoked pursuant to Section 121 (d)(4)(B) of CERCLA.

Section 121 (d) of CERCLA requires that remedial actions meet legally applicable or relevant and appropriate requirements (ARARs) of other environmental laws. Legally, "applicable" requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site. "Relevant and appropriate" requirements are those requirements that, while not legally applicable to the remedial action, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the remedial action.

Non-promulgated advisories or guidance documents issued by federal or state governments ("to-be-considered or TBCs") do not have the status of ARARs; however, where no applicable or relevant and appropriate requirements exist, or for some reason may not be sufficiently protective, non-promulgated advisories or guidance documents may be considered in determining the necessary level of cleanup for protection of human health and the environment.

For a complete list of ARARs and TBCs for the alternatives at this site, see the FS Report. Below is a discussion of the key ARARs for the selected remedy.

10.2.1 Chemical-specific-ARARs

Chemical-specific ARARs regulate the release to the environment of specific substances having certain chemical characteristics. Chemical-specific ARARs typically determine the extent of clean-up at a site.

10.2.1.2 Federal ARARs

Clean Air Act National Ambient Air Quality Standards 40 CFR 50 - These regulations provide air emission requirements for actions which may release contaminants into the air. As the selected remedy involves excavation activities which may release contaminants or particulates into the air, emission requirements pomulgated under this act are relevant and appropriate.

10.2.1.2 State ARARs

Michigan Natural Resources and Environmental Protection Act 451, Part 201, as amended (formerly Act 307) - These regulations provide guidelines and cleanup standards for contaminated sites based on background levels, detection limits, health-based criteria, and current or anticipated land use, U.S. EPA's selected soil cleanup standards for this site are in compliance with Act 451, Part 201 and its implementing rules in that they meet the standard for selection of standards. The cleanup levels for contaminants in soil are determined by comparing current concentrations of contaminants with background concentrations and with allowable concentrations based on (1) risks and (2) ARARs. Table 33 lists the representative chemicals found in soil and the corresponding cleanup standards. These regulations are considered applicable to the Site.

Michigan Natural Resources and Environmental Protection Act and Air Pollution Rules, Michigan Ambient Air Quality Standards (MAAQS), Act 451, Part 55 (formerly Act 348 of 1965) - This act provides air emission requirements for actions which may release contaminants into the air. The selected remedy involves excavation activities which may release contaminants or particulates into the air. This act is relevant and appropriate.

10.2.2.0 Location-specific ARARs

Location-specific ARARs are those requirements that relate to the geographical position of the site. These include:

10.2.2.1 Federal ARARs

Clean Water Act Section 404 - This section of the Act regulates the discharge of dredge and fill materials at sites to waters of the United States. These regulations are applicable to excavation and backfilling activities which may take place adjacent to the creek in the former wetlands area.

Floodplain Management Executive Order 11988 - This order is applicable at this site. It requires the minimization of potential harm to or within flood plains and the avoidance of long and short term adverse impacts associated with the occupancy and modification of flood plains.

10.2.2.2 State ARARs

Soil Erosion and Sedimentation Control Act, Act 347 of 1972 - This act is applicable to this site because of the selected remedy's use of construction activities that may impact Ecorse Creek. The act regulates earth changes, including cut and fill activities which may contribute to soil erosion and sedimentation of surface water of the State. Act 347 would apply to any such action where more than one acre of land is affected or regulated action occurs within 500 feet of a lake or stream.

10.2.3.0 Action-specific ARARs

Action-specific ARARs are requirements that define acceptable treatment and disposal procedures for hazardous substances. These include:

10.2.3.1 Federal ARARs

RCRA Subtitle C Land Disposal Restrictions (LDRs) - These regulations govern the storage and disposal of hazardous waste. These regulations will be applicable to any site generated wastes which are characterized as hazardous waste. Soils at the site may exceed the TCLP standard for characteristic waste. If so, treatment of the excavated soils would be required prior to disposal in an off-site landfill.

10.2.3.2 State ARARs

Inland Lakes and Streams Act, Public Act 346 of 1972, as amended - The act regulates construction activities on or above bottomlands of inland lakes and streams. This act will be applicable to the selected remedy, because it addresses the mitigation of potential run-off, erosion, silting, and sedimentation in surface waters during construction.

Michigan Natural Resources and Environmental Protection Act, Act 451, Part 17 (formerly Act 127 of 1970) - This act prohibits any action that pollutes, impairs, or destroys the natural resources of the State. This act is applicable to the site since the site and the Ecorse Creek are viewed as natural resources.

Michigan Natural Resources and Environmental Protection Act, Act 451 Part 111 of 1994 (formerly Act 64 of 1979), as amended - This act regulates the generation, transportation, treatment, storage and disposal of hazardous waste. This ARAR will be applicable if the waste being disposed of off-site is characterized as hazardous.

Michigan Natural Resources and Environmental Protection Act, Act 451, Part 115 of 1994 (formerly Act 641 of

1978), as amended - This act regulates the disposal of non-hazardous solid waste. This act will be applicable for the off-site disposal of any waste which is non-hazardous.

10.3 Cost Effectiveness

Cost effectiveness compares the effectiveness of an alternative in proportion to its cost of providing environmental benefits. It is estimated that the cost of implementing the selected remedy will be $646,000 in total capital costs. There are no costs associated with operation and maintenance. Appendix B, Table B-3 contains the detailed cost estimate for the selected remedy.

The selected remedy, Alternative 3, has been determined to afford overall effectiveness proportional to its cost. Alternative 3 carries moderate costs in comparison to the other alternatives considered. The No Action alternative, the alternative less costly than Alternative 3, does not offer the protectiveness provided by Alternative 3, because it leaves contaminants on-site.

10.4 Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner at this site. Of those alternatives that are protective of human health and the environment and that comply with ARARs, U.S. EPA has determined that the selected remedy provides the best balance in terms of long-term effectiveness and permanence, reduction of toxicity, mobility, or volume of contaminants, short term effectiveness, implementability, and cost, taking into consideration State and community acceptance.

The excavation and off-site disposal of the shallow and deep contaminated soil will provide the most permanent solution practical, proportionate to the cost.

10.5 Preference for Treatment as a Principal Element

Based on current information, U.S. EPA and the State of Michigan believe that the selected remedy is protective of human health and the environment and utilizes permanent solutions and alternative treatment technologies to the maximum extent possible. The remedy, however, does not satisfy the statutory preference for treatment of the hazardous substances present at the site as a principal element because such treatment was not found to be practical or cost effective. If characterized as hazardous, however, the material will be treated off-site prior to disposal.

11.0 Summary

The selected remedy will satisfy the statutory requirements established in Section 121 of CERCLA, as amended by SARA, to protect human health and the environment, will comply with ARARs, will provide overall effectiveness appropriate to its costs, and will use permanent solutions and alternate treatment technologies to the maximum extent practicable.

FIGURES

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TABLES

TABLE 1

TABLE
SURFACE SOIL INORGANIC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Site Specific Background Concentrations	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Background	Detection Frequency Exceeding Background	Mean	UCL 95%	Units
Aluminum	43	43	100%	3150	14800	25958	JD	0	0%	9001.73	10005.26	mg/kg
Antimony	42	38	90%	0.16	7.0	0.45	150	12	29%	0.65	0.90	mg/kg
Arsenic	165	164	99%	1.30	24.7	13.6	5.5	3	2%	5.89	6.41	mg/kg
Barium	165	165	100%	19.90	1160	127	30,000	9	5%	76.13	82.40	mg/kg
Beryllium	43	43	100%	0.15	0.97	1.2	2.3	0	0%	0.51	0.56	mg/kg
Cadmium	165	63	88%	0.08	21.2	1.7	210	8	5%	0.87	0.97	mg/kg
Calcium	43	43	100%	2690	115000	62131	NA	6	14%	30832.37	45238.59	mg/kg
Chromium	165	165	100%	2.30	676	37.8	2,000	24	15%	28.23	32.44	mg/kg
Cobalt	43	43	100%	1.80	14.2	16.9	2,100	0	0%	6.86	7.71	mg/kg
Copper	165	160	97%	4.40	1510	30.6	16,000	22	13%	23.06	25.97	mg/kg
Iron	165	165	100%	2540	64700	34014	ID	4	2%	14415.35	15659.35	mg/kg
Lead	165	165	100%	6.40	820	59.8	400	48	29%	59.50	68.83	mg/kg
Magnesium	43	43	100%	1050	59700	15014	1,000,000	5	12%	8606.23	11150.11	mg/kg
Manganese	43	43	100%	66.80	15000	429	2,000	16	37%	836.13	1230.59	mg/kg
Mercury	165	46	28%	0.10	1.4	0.25	130	14	9%	0.11	0.12	mg/kg
Nickel	43	43	100%	4.50	46.7	50.9	32,000	0	0%	19.50	22.06	mg/kg
Potassium	43	43	100%	370.00	4830	6757	NA	0	0%	1836.00	2082.29	mg/kg
Selenium	165	22	13%	0.41	3.8	1.64	2,100	2	1%	0.60	0.64	mg/kg
Silver	165	31	19%	0.07	2.3	0.14	2,000	19	12%	1.35	1.68	mg/kg
Sodium	43	28	65%	113	936	504	1,000,000	1	2%	194.08	245.43	mg/kg
Thallium	43	1	2%	0.44	0.44	0.75	28	1	2%	0.20	0.22	mg/kg
Vanadium	43	43	100%	9.50	189	53.8	3,700	3	7%	31.47	37.34	mg/kg
Zinc	165	165	100%	9.90	5650	116	140,000	33	20%	106.76	120.70	mg/kg

ID = Inadequate data to develop criterion; NA = Not available

10/11/95

TABLE 2

TABLE
SUBSURFACE SOIL INORGANIC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	MDNR Residential Cleanup Criteria Direct Contact	Site Specific Background Concentrations	Positive Detections Exceeding Background	Detection Frequency Exceeding Background	Mean	UCL 95%	Units
Aluminum	40	40	100%	2760.00	19200	ID	25958	0	0%	10738.98	12362.20	mg/kg
Antimony	36	30	83%	0.00	4.0	150.0	0.45	11	31%	0.59	0.87	mg/kg
Arsenic	347	328	95%	1.10	30.9	5.5	13.6	135	39%	7.19	7.61	mg/kg
Barium	347	347	100%	10.80	603	30000	127	150	43%	79.11	83.28	mg/kg
Beryllium	40	39	98%	0.18	1.3	2.3	1.2	1	3%	0.59	0.66	mg/kg
Cadmium	347	67	19%	0.04	3.9	210.0	1.7	32	9%	0.93	1.00	mg/kg
Calcium	40	40	100%	1250.00	64300	NA	62131	1	3%	25701.20	39030.16	mg/kg
Chromium	347	335	97%	4.00	499	2000	37.8	145	42%	22.41	24.61	mg/kg
Cobalt	40	40	100%	2.40	18.1	2100.0	16.9	1	3%	8.27	9.43	mg/kg
Copper	347	326	94%	5.00	810	16000	30.6	157	45%	24.26	26.35	mg/kg
Iron	347	347	100%	2270.00	114000	ID	34014	143	41%	16980.52	17910.99	mg/kg
Lead	347	346	100%	0.64	4510	400	59.8	168	48%	44.70	50.01	mg/kg
Magnesium	40	40	100%	648.00	18700	1000000	15014	3	8%	7405.12	9649.19	mg/kg
Manganese	40	40	100%	65.80	2010	2000	429	3	8%	274.05	341.79	mg/kg
Mercury	347	87	25%	0.10	8.8	130.0	0.25	60	17%	0.15	0.16	mg/kg
Nickel	40	40	100%	5.00	156	32000	50.9	1	3%	29.10	34.05	mg/kg
Potassium	40	40	100%	302.00	5100	NA	6757	0	0%	2322.01	2801.01	mg/kg
Selenium	347	34	10%	0.56	6.1	2100.0	1.64	20	6%	0.95	1.01	mg/kg
Silver	347	17	5%	0.08	12.7	2000.0	0.14	16	5%	1.75	1.98	mg/kg
Sodium	40	33	83%	185.00	981	1000000	504	13	33%	421.26	537.31	mg/kg
Thallium	40	2	5%	1.10	1.4	28.0	0.75	2	5%	0.35	0.43	mg/kg
Vanadium	40	40	100%	7.60	55.6	3700.0	53.8	1	3%	27.20	30.54	mg/kg
Zinc	347	343	99%	11.40	1090	140000	116	166	48%	84.30	92.46	mg/kg

ID = Inadequate data to develop criterion; NA = Not available
10/11/95

TABLE 3
SURFACE SOIL VOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Criteria	Detection Frequency Exceeding Criteria	Mean	UCL 95%	Units
Chloromethane	46	0	0%	0.00	0.0	200,000	0	0%	ND	6.27	ug/kg
Bromomethane	46	0	0%	0.00	0.0	150,000	0	0%	ND	6.27	ug/kg
Vinyl Choride	46	0	0%	0.00	0.0	1,200	0	0%	ND	6.27	ug/kg
Chloroethane	46	0	0%	0.00	0.0	670,000	0	0%	10.25	8.06	ug/kg
Methylene Chloride	46	12	26%	2.00	19.0	340,000	0	0%	17.42	10.03	ug/kg
Acetone	46	12	26%	5.00	76.0	11,000,000	0	0%	4.5	6.41	ug/kg
Carbon Disulfide	46	4	9%	2.00	10.0	12,000,000	0	0%	ND	6.27	ug/kg
1,1-Dichloroethane	46	0	0%	0.00	0.0	110,000	0	0%	ND	6.27	ug/kg
1,1-Dichloroethane	46	0	0%	0.00	0.0	13,000,000	0	0%	ND	6.27	ug/kg
1,2-Dichloroethane (total)	46	0	0%	0.00	0.0	1200000.00	0	0%	ND	6.27	ug/kg
Chloroform	46	0	0%	0.00	0.0	420,000	0	0%	ND	6.27	ug/kg
1,2-Dichloroethane	46	0	0%	0.00	0.0	28,000	0	0%	ND	6.27	ug/kg
2-Butanone	46	2	4%	3.00	5.0	200,000,000	0	0%	4.0	6.28	ug/kg
1,1,1-Trichloroethane	46	2	4%	2.00	3.0	3,100,000	0	0%	2.5	6.31	ug/kg
Carbon Tetrachloride	46	0	0%	0.00	0.0	20,000	0	0%	ND	6.27	ug/kg
Bromodichloromethane	46	0	0%	0.00	0.0	41,000	0	0%	ND	6.27	ug/kg
1,2-Dichloropropane	46	0	0%	0.00	0.0	38,000	0	0%	ND	6.27	ug/kg
cls-1,3-Dichloropropene	46	0	0%	0.00	0.0	14,000	0	0%	ND	6.27	ug/kg
Trichloroethene	46	1	2%	3.00	3.0	160,000	0	0%	3.0	6.27	ug/kg
Dibromochloromethane	46	0	0%	0.00	0.0	31,000	0	0%	ND	6.27	ug/kg
1,1,2-Trichloroethene	46	1	2%	3.00	3.0	45,000	0	0%	3.0	6.27	ug/kg
Benzene	46	0	0%	0.00	0.0	88,000	0	0%	ND	6.27	ug/kg
Trans-1,3-Dichloropropene	46	0	0%	0.00	0.0	14,000	0	0%	ND	6.27	ug/kg
Bromoform	46	0	0%	0.00	0.0	320,000	0	0%	ND	6.27	ug/kg
4-Methyl-2-Pentanone	46	0	0%	0.00	0.0	5,500,000	0	0%	ND	6.27	ug/kg
2-Hexanone	46	0	0%	0.00	0.0	15,000,000	0	0%	ND	6.27	ug/kg
Tetrachloroethene	46	0	0%	0.00	0.0	50,000	0	0%	ND	6.27	ug/kg
1,1,2,2-Tetrachloroethane	46	0	0%	0.00	0.0	13,000	0	0%	ND	6.27	ug/kg
Toluene	46	1	2%	2.00	2.0	24,000,000	0	0%	2.0	6.36	ug/kg
Chlorobenzene	46	0	0%	0.00	0.0	2,100,000	0	0%	ND	6.27	ug/kg
Ethylbenzene	46	0	0%	0.00	0.0	11,000,000	0	0%	ND	6.27	ug/kg
Styrene	46	0	0%	0.00	0.0	85,000	0	0%	ND	6.27	ug/kg
Xylenes (total)	46	0	0%	0.00	0.0	200,000,000	0	0%	1.5	6.57	ug/kg

ND = Compound was Not Detected

TABLE 4
SURFACE SOIL VOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Criteria	Detection Frequency Exceeding Criteria	Mean	UCL 95%	Units
Chloromethane	145	0	0%	0.0	0.0	200,000	0	0%	ND	12.67	ug/kg
Bromomethane	145	0	0%	0.0	0.0	150,000	0	0%	ND	12.67	ug/kg
Vinyl Choride	145	0	0%	0.0	0.0	1,200	0	0%	ND	12.67	ug/kg
Chloroethane	145	0	0%	11.0	110	670,000	0	0%	ND	12.67	ug/kg
Methylene Chloride	145	29	20%	7.0	260	340,000	0	0%	13.60	15.72	ug/kg
Acetone	145	79	54%	1.0	1300	11,000,000	0	0%	92.01	129.43	ug/kg
Carbon Disulfide	145	56	39%	1.0	65000	12,000,000	0	0%	20.81	28.33	ug/kg
1,1-Dichloroethane	145	0	0%	0.0	0.0	110,000	0	0%	ND	12.67	ug/kg
1,1-Dichloroethane	145	0	0%	0.0	0.0	13,000,000	0	0%	ND	12.67	ug/kg
1,2-Dichloroethane (total)	145	0	0%	0.0	0.0	120000.00	0	0%	ND	12.67	ug/kg
Chloroform	145	1	1%	2.0	2.0	420,000	0	0%	11.11	12.68	ug/kg
1,2-Dichloroethane	145	0	0%	0.0	330	28,000	0	0%	ND	12.67	ug/kg
2-Butanone	145	54	37%	2.0	190	200,000,000	0	0%	21.45	26.25	ug/kg
1,1,1-Trichloroethane	145	0	0%	0.0	0.0	3,100,000	0	0%	ND	12.67	ug/kg
Carbon Tetrachloride	145	0	0%	0.0	0.0	20,000	0	0%	ND	12.67	ug/kg
Bromodichloromethane	145	0	0%	0.0	0.0	41,000	0	0%	ND	12.67	ug/kg
1,2-Dichloropropane	145	0	0%	0.0	0.0	38,000	0	0%	ND	12.67	ug/kg
cls-1,3-Dichloropropene	145	0	0%	0.0	0.0	14,000	0	0%	ND	12.67	ug/kg
Trichloroethene	145	1	1%	3.0	0.0	160,000	0	0%	11.11	12.67	ug/kg
Dibromochloromethane	145	0	0%	0.0	0.0	31,000	0	0%	ND	12.67	ug/kg
1,1,2-Trichloroethene	145	0	0%	0.0	0.0	45,000	0	0%	ND	12.67	ug/kg
Benzene	145	4	3%	0.7	26.0	88,000	0	0%	10.70	12.19	ug/kg
Trans-1,3-Dichloropropene	145	0	0%	0.0	0.0	14,000	0	0%	ND	12.67	ug/kg
Bromoform	145	0	0%	0.0	0.0	320,000	0	0%	ND	12.67	ug/kg
4-Methyl-2-Pentanone	145	0	0%	0.0	0.0	5,500,000	0	0%	ND	12.67	ug/kg
2-Hexanone	145	0	0%	0.0	0.0	15,000,000	0	0%	ND	12.67	ug/kg
Tetrachloroethene	145	0	0%	0.0	0.0	50,000	0	0%	ND	12.67	ug/kg
1,1,2,2-Tetrachloroethane	145	2	1%	2.0	10.0	13,000	0	0%	11.10	12.75	ug/kg
Toluene	145	6	4%	1.0	15.0	24,000,000	0	0%	10.83	12.43	ug/kg
Chlorobenzene	145	0	0%	0.0	13.0	2,100,000	0	0%	ND	12.67	ug/kg
Ethylbenzene	145	3	2%	1.0	11.0	11,000,000	0	0%	10.80	12.30	ug/kg
Styrene	145	1	1%	2.0	94.0	85,000	0	0%	11.10	12.67	ug/kg
Xylenes (total)	145	6	4%	0.6	21.0	200,000,000	0	0%	11.03	12.61	ug/kg

ND = Compound was Not Detected

Table 5
SURFACE SOIL CYANIDE ANALYTICAL RESULTS FROM PREVIOUS INVESTIGATION
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Site Specific Background Concentrations	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Background	Detection Frequency Exceeding Background	Mean Estimation (a)	UCL 95%	Units
Cyanide	120	88	73%	0.55	1730	0.49	9,300	86	72%	6.02	9.81	mg/kg

Table 6
SUBSURFACE SOIL CYANIDE ANALYTICAL RESULTS FROM PREVIOUS INVESTIGATION
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Site Specific Background Concentrations	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Background	Detection Frequency Exceeding Background	Mean Estimation (a)	UCL 95%	Units
Cyanide	307	237	77%	0.59	32300	0.49	9,300	237	77%	593.70	1005.72	mg/kg

Table 7
SURFACE SOIL CYANIDE ANALYTICAL RESULTS FROM RI
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Site Specific Background Concentrations	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Background	Detection Frequency Exceeding Background	Mean Estimation (a)	UCL 95%	Units
Cyanide	218	39	18%	0.24	4.00	0.49	9,300	10	5%	0.18	0.19	mg/kg

Table 8
SURFACE SOIL CYANIDE ANALYTICAL RESULTS FROM RI
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Site Specific Background Concentrations	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Background	Detection Frequency Exceeding Background	Mean Estimation (a)	UCL 95%	Units
Cyanide	59	5	9%	0.37	1.50	0.49	9,300	2	3%	0.23	0.26	mg/kg

< IMG SRC 0596304H>
< IMG SRC 0596304I>

TABLE 11
SURFACE SOIL DIOXIN ANALYTICAL RESULTS FROM RI
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Criteria	Detection Frequency Exceeding Criteria	Mean	UCL 95%	Units
TCDFs (total)	8	0	0%	0.0	0.0		0	0%	ND	0.51	ng/g
2,3,7,8-TCDF	8	0	0%	0.0	0.0		0	0%	ND	0.28	ng/g
PeCDFs (total)	8	0	0%	0.0	0.0		0	0%	ND	0.49	ng/g
1,2,3,7,8-PeCDF	8	0	0%	0.0	0.0		0	0%	ND	0.16	ng/g
2,3,4,7,8-PeCDF	8	0	0%	0.0	0.0		0	0%	ND	0.17	ng/g
HxCDFs (total)	8	0	0%	0.0	0.0		0	0%	ND	0.12	ng/g
1,2,3,4,7,8-HxCDF	8	0	0%	0.0	0.0		0	0%	ND	0.05	ng/g
1,2,3,6,7,8-HxCDF	8	0	0%	0.0	0.0		0	0%	ND	0.05	ng/g
2,3,4,6,7,8-HxCDF	8	0	0%	0.0	0.0		0	0%	ND	0.05	ng/g
1,2,3,7,8,9-HxCDF	8	0	0%	0.0	0.0		0	0%	ND	0.06	ng/g
HpCDFs (total)	8	0	0%	0.0	0.0		0	0%	ND	0.06	ng/g
1,2,3,4,6,7,8-HpCDF	8	0	0%	0.0	0.0		0	0%	ND	0.06	ng/g
1,2,3,4,7,8,9-HpCDF	8	0	0%	0.0	0.0		0	0%	ND	0.08	ng/g
OCDF	8	0	0%	0.0	0.0		0	0%	ND	0.07	ng/g
RCDDs (total)	8	0	0%	0.0	0.0		0	0%	ND	0.24	ng/g
2,3,7,8-TCDD	8	0	0%	0.0	0.0		0	0%	ND	0.10	ng/g
PeCDDs (total)	8	0	0%	0.0	0.0		0	0%	ND	0.13	ng/g
1,2,3,7,8-PeCDD	8	0	0%	0.0	0.0		0	0%	ND	0.13	ng/g
HxCDDs (total)	8	0	0%	0.0	0.0		0	0%	ND	0.09	ng/g
1,2,3,4,7,8-HxCDD	8	0	0%	0.0	0.0		0	0%	ND	0.11	ng/g
1,2,3,6,7,8-HxCDD	8	0	0%	0.0	0.0		0	0%	ND	0.09	ng/g
1,2,3,7,8,9-HxCDD	8	0	0%	0.0	0.0		0	0%	ND	0.10	ng/g
HpCDDs (total)	8	0	0%	0.0	0.0		0	0%	ND	0.14	ng/g
1,2,3,4,6,7,8-HpCDD	8	0	0%	0.0	0.0		0	0%	ND	0.12	ng/g
OCDD	8	0	63%	0.47	16.0		0	0%	7.35	1835.97	ng/g
Total TCDDs equiv					0.016	0.09	0	0%			

ND = Compound was Not Detected

TABLE 12
SURFACE SOIL DIOXIN ANALYTICAL RESULTS FROM RI
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Criteria	Detection Frequency Exceeding Criteria	Mean	UCL 95%	Units
TCDFs (total)	16	0	0%	0.0	0.0		0	0%	ND	0.22	ng/g
2,3,7,8-TCDF	16	0	0%	0.0	0.0		0	0%	ND	0.18	ng/g
PeCDFs (total)	16	0	0%	0.0	0.0		0	0%	ND	0.18	ng/g
1,2,3,7,8-PeCDF	16	0	0%	0.0	0.0		0	0%	ND	0.18	ng/g
2,3,4,7,8-PeCDF	16	0	0%	0.0	0.0		0	0%	ND	0.20	ng/g
HxCDFs (total)	16	0	0%	0.0	0.0		0	0%	ND	0.07	ng/g
1,2,3,4,7,8-HxCDF	16	0	0%	0.0	0.0		0	0%	ND	0.09	ng/g
1,2,3,6,7,8-HxCDF	16	0	0%	0.0	0.0		0	0%	ND	0.07	ng/g
2,3,4,6,7,8-HxCDF	16	0	0%	0.0	0.0		0	0%	ND	0.09	ng/g
1,2,3,7,8,9-HxCDF	16	0	0%	0.0	0.0		0	0%	ND	0.10	ng/g
HpCDFs (total)	16	0	0%	0.0	0.0		0	0%	ND	0.12	ng/g
1,2,3,4,6,7,8-HpCDF	16	0	0%	0.0	0.0		0	0%	ND	0.12	ng/g
1,2,3,4,7,8,9-HpCDF	16	0	0%	0.0	0.0		0	0%	ND	0.15	ng/g
OCDF	16	0	0%	0.0	0.0		0	0%	ND	0.12	ng/g
RCDDs (total)	16	0	0%	0.0	0.0		0	0%	ND	0.11	ng/g
2,3,7,8-TCDD	16	0	0%	0.0	0.0		0	0%	ND	0.09	ng/g
PeCDDs (total)	16	0	0%	0.0	0.0		0	0%	ND	0.25	ng/g
1,2,3,7,8-PeCDD	16	0	0%	0.0	0.0		0	0%	ND	0.25	ng/g
HxCDDs (total)	16	0	0%	0.0	0.0		0	0%	ND	0.18	ng/g
1,2,3,4,7,8-HxCDD	16	0	0%	0.0	0.0		0	0%	ND	0.20	ng/g
1,2,3,6,7,8-HxCDD	16	0	0%	0.0	0.0		0	0%	ND	0.18	ng/g
1,2,3,7,8,9-HxCDD	16	0	0%	0.0	0.0		0	0%	ND	0.19	ng/g
HpCDDs (total)	16	0	0%	0.0	0.0		0	0%	ND	0.32	ng/g
1,2,3,4,6,7,8-HpCDD	16	0	0%	0.0	0.0		0	0%	ND	0.32	ng/g
OCDD	16	7	44%	0.78	8.6		0	0%	3.62	38.65	ng/g
Total TCDDs equiv					0.0086	0.09	0	0%			

ND = Compound was Not Detected

TABLE 13
SURFACE SOIL PCB ANALYTICAL RESULTS FROM RI
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Criteria	Detection Frequency Exceeding Criteria	Mean	UCL 95%	Units
Aroclor-1016	16	0	0%	0.0	0.0	2,300	0	0%	ND	56.74	ug/kg
Aroclor-1221	16	0	0%	0.0	0.0	2,300	0	0%	ND	56.74	ug/kg
Aroclor-1232	16	0	0%	0.0	0.0	2,300	0	0%	ND	56.74	ug/kg
Aroclor-1242	16	0	0%	0.0	0.0	2,300	0	0%	ND	56.74	ug/kg
Aroclor-1248	16	0	0%	0.0	0.0	2,300	0	0%	ND	56.74	ug/kg
Aroclor-1254	16	0	0%	0.0	0.0	2,300	0	0%	ND	56.74	ug/kg
Aroclor-1260	16	2	12%	24.0	48.0	2,300	0	0%	36.0	56.74	ug/kg

ND = Compound was Not Detected

TABLE 14
SURFACE SOIL PCB ANALYTICAL RESULTS FROM RI
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	MDNR Residential Cleanup Criteria Direct Contact	Positive Detections Exceeding Criteria	Detection Frequency Exceeding Criteria	Mean	UCL 95%	Units
Aroclor-1016	17	0	0%	0.0	0.0	2,300	0	0%	ND	37.37	ug/kg
Aroclor-1221	17	0	0%	0.0	0.0	2,300	0	0%	ND	74.51	ug/kg
Aroclor-1232	17	0	0%	0.0	0.0	2,300	0	0%	ND	37.37	ug/kg
Aroclor-1242	17	0	0%	0.0	0.0	2,300	0	0%	ND	37.37	ug/kg
Aroclor-1248	17	0	0%	0.0	0.0	2,300	0	0%	ND	37.37	ug/kg
Aroclor-1254	17	1	6%	250.0	250	2,300	0	0%	55.58	106.67	ug/kg
Aroclor-1260	17	1	6%	4.0	4.0	2,300	0	0%	29.92	42.31	ug/kg

ND = Compound was Not Detected

TABLE 15
PERCHED GROUNDWATER INORGANIC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Site Specific Background	Mean	UCL 95%	Units
Cyanide	7	4	57%	1.51	31.4	490	15.11	79.89	ug/l
Aluminum	3	0	0%	0.0	0.0	25,958,000	ND	126.53	ug/l
Antimony	3	0	0%	0.0	0.0	450	ND	NA	ug/l
Arsenic	3	1	33%	5.6	5.6	13,640	2.96	29241220.78	ug/l
Barium	3	3	100%	253.0	276	127,000	264.75	NA	ug/l
Beryllium	3	0	0%	0.0	0.0	1,200	ND	NA	ug/l
Cadmium	3	0	0%	0.0	0.0	1,650	ND	NA	ug/l
Calcium	3	3	100%	236000	254000	62,131,000	247401.47	NA	ug/l
Chromium	3	0	0%	0.0	0.0	37,800	ND	0.58	ug/l
Cobalt	3	3	100%	0.6	1.6	16,900	1.19	13.12	ug/l
Copper	3	2	67%	0.4	0.9	30,600	0.55	812.54	ug/l
Iron	3	3	100%	1190	7790	34,014,000	7036.97	120902672.79	ug/l
Lead	3	0	0%	0.0	0.0	59,800	ND	NA	ug/l
Magnesium	3	3	100%	104000	129000	15,014,000	120647.89	153006.19	ug/l
Manganese	3	3	100%	993.0	1420	429,000	1284.00	2067.72	ug/l
Mercury	3	0	0%	0.0	0.0	250	ND	NA	ug/l
Nickel	3	1	33%	4.2	4.2	50,900	2.24	39837.62	ug/l
Potassium	3	3	100%	7420	25600	6,757,000	14586.39	328723.07	ug/l
Selenium	3	2	67%	4.6	8.1	1,640	5.45	1853.04	ug/l
Silver	3	0	0%	0.0	0.0	140	ND	NA	ug/l
Sodium	3	3	100%	84700	100000	504,000	94537.47	113017.73	ug/l
Thallium	1	1	100%	11.9	11.9	750	11.90	NA	ug/l
Vanadium	3	3	100%	0.58	2.5	53,800	1.39	455.45	ug/l
Zinc	3	3	100%	0.54	2.4	116,000	1.72	507.16	ug/l

ND = Analyte was Not Detected

TABLE 16
PERCHED GROUNDWATER VOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Chloromethane	2	0	0%	0.00	0.00	ND	ND	ug/L
Bromomethane	2	0	0%	0.00	0.00	ND	ND	ug/L
Vinyl Chloride	2	0	0%	0.00	0.00	ND	ND	ug/L
Chloroethane	2	0	0%	0.00	0.00	ND	ND	ug/L
Methylene Chloride	2	0	0%	0.00	0.00	ND	ND	ug/L
Acetone	2	0	0%	0.00	0.00	ND	ND	ug/L
Carbon Disulfide	2	0	0%	0.00	0.00	ND	ND	ug/L
1,1-Dichloroethene	2	0	0%	0.00	0.00	ND	ND	ug/L
1,1-Dichloroethane	2	0	0%	0.00	0.00	ND	ND	ug/L
1,2-Dichloroethene (total)	2	0	0%	0.00	0.00	ND	ND	ug/L
Chloroform	2	0	0%	0.00	0.00	ND	ND	ug/L
1,2-Dichloroethane	2	0	0%	0.00	0.00	ND	ND	ug/L
2-Butanone	2	0	0%	0.00	0.00	ND	ND	ug/L
1,1,1-Trichloroethane	2	0	0%	0.00	0.00	ND	ND	ug/L
Carbon Tetrachloride	2	0	0%	0.00	0.00	ND	ND	ug/L
Bromodichloromethane	2	0	0%	0.00	0.00	ND	ND	ug/L
1,2-Dichloropropane	2	0	0%	0.00	0.00	ND	ND	ug/L
cis-1,3-Dichloropropene	2	0	0%	0.00	0.00	ND	ND	ug/L
Trichloroethene	2	0	0%	0.00	0.00	ND	ND	ug/L
Dibromochloromethane	2	0	0%	0.00	0.00	ND	ND	ug/L
1,1,2-Trichloroethane	2	0	0%	0.00	0.00	ND	ND	ug/L
Benzene	2	0	0%	0.00	0.00	ND	ND	ug/L
Trans-1,3-Dichloropropene	2	0	0%	0.00	0.00	ND	ND	ug/L
Bromoform.	2	0	0%	0.00	0.00	ND	ND	ug/L
4-Methyl-2-Pentanone	2	0	0%	0.00	0.00	ND	ND	ug/L
2-Hexanone	2	0	0%	0.00	0.00	ND	ND	ug/L
Tetrachloroethene	2	0	0%	0.00	0.00	ND	ND	ug/L
1,1,2,2-Tetrachloroethane	2	0	0%	0.00	0.00	ND	ND	ug/L
Toluene	2	0	0%	0.00	0.00	ND	ND	ug/L
Chlorobenzene	2	0	0%	0.00	0.00	ND	ND	ug/L
Ethylbenzene	2	0	0%	0.00	0.00	ND	ND	ug/L
Styrene	2	0	0%	0.00	0.00	ND	ND	ug/L
Xylenes (total)	2	1	50%	1.00	1.00	1.00	NA	ug/L

ND = Compound was Not Detected

Table 17
PERCHED GROUNDWATER SVOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Naphthalene	2	1	50%	1.00	1.00	1.00	NA	ug/L
Acenaphthylene	2	0	0%	0.00	0.00	ND	ND	ug/L
Acenaphthene	2	1	50%	0.50	0.50	0.50	NA	ug/L
Fluorene,	2	0	0%	0.00	0.00	ND	ND	ug/L
Phenanthrene	2	0	0%	0.00	0.00	ND	ND	ug/L
Anthracene	2	0	0%	0.00	0.00	ND	ND	ug/L
Fluoranthene	2	0	0%	0.00	0.00	ND	ND	ug/L
Pyrene	2	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(a)anthraceno	2	0	0%	0.00	0.00	ND	ND	ug/L
Chrysene	2	0	0%	0.00	0.00	ND	ND	ug/L
bis(2-Ethylhexy)phthalato	2	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(b)fluoranthene	2	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(k)fluoranthene	2	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(a)pyrene	2	0	0%	0.00	0.00	ND	ND	ug/L
Indeno(1,2,3-cd)pyrene	2	0	0%	0.00	0.00	ND	ND	ug/L
Dibenzo(a,h)anthracene	2	0	0%	0.00	0.00	ND	ND	ug/L
2-Methylnaphthalene	2	1	50%	0.30	0.00	0.30	NA	ug/L
Benzo(g,h,i)perylene	2	0	0%	0.00	0.00	ND	ND	ug/L

ND = Compound was Not Detected

Table 18
SURFACE WATER INORGANIC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Cyanide	6	6	100%	18.00	22.80	20.20	21.71	ug/L
Aluminum	6	6	100%	848.00	2600.00	1582.00	2966.80	ug/L
Antimony	6	0	0%	0.00	0.00	ND	2.18	ug/L
Arsenic	6	5	83%	1.70	3.00	2,26	2.78	ug/L
Barium	6	6	100%	80.40	108.00	89.73	98.64	ug/L
Beryllium	6	1	17%	0.11	0.11	0.11	0.13	ug/L
Cadmium	6	5	83%	0.59	1.70	0.92	1.74	ug/L
Calcium	6	6	100%	72400.00	84600.00	77283.33	81296.98	ug/L
Chromium	6	6	100%	7.70	19.30	11.23	15.64	ug/L
Cobalt	6	5	83%	0.52	1.60	1.12	2.20	ug/L
Copper	6	6	100%	7.30	27.10	13.48	24.06	ug/L
Iron	6	6	100%	1320.00	4920.00	2565.00	4833.73	ug/L
Lead	6	4	67%	19.80	57.80	30.08	46.07	ug/L
Magnesium	6	6	100%	12400.00	14900.00	13666.67	14497.32	ug/L
Manganese	6	6	100%	129.00	221.00	161.17	193.94	ug/L
Mercury	6	0	0%	0.00	0.00	ND	ND	ug/L
Nickel	6	1	17%	8.20	8.20	8.20	7.27	ug/L
Potassium	6	6	100%	13800.00	18300.00	15616.67	17042.40	ug/L
Selenium	6	0	0%	0.00	0.00	ND	ND	ug/L
Silver	6	0	0%	0.00	0.00	ND	ND	ug/L
Sodium	6	6	100%	702000.00	962000.00	824833.33	917865.95	ug/L
Thallium	0	0	0%	0.00	0.00	ND	ND	ug/L
Vanadium	6	6	100%	4.20	9.80	6.43	9.14	ug/L
Zinc	6	3	50%	102.00	211.00	139.67	166.11	ug/L

ND = Compound was Not Detected

Table 19
SURFACE WATER VOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Chloromethane	6	0	0%	0.00	0.00	ND	ND	ug/L
Bromomethane	6	0	0%	0.00	0.00	ND	ND	ug/L
Vinyl Chloride	6	0	0%	0.00	0.00	ND	ND	ug/L
Chloroethane	6	0	0%	0.00	0.00	ND	ND	ug/L
Methylene Chloride	6	0	0%	0.00	0.00	ND	ND	ug/L
Acetone	6	0	0%	0.00	0.00	ND	ND	ug/L
Carbon Disulfide	6	0	0%	0.00	0.00	ND	ND	ug/L
1,1-Dichloroethene	6	0	0%	0.00	0.00	ND	ND	ug/L
1,1-Dichloroethane	6	0	0%	0.00	0.00	ND	ND	ug/L
1,2-Dichloroethene (total)	6	0	0%	0.00	0.00	ND	ND	ug/L
Chloroform	6	0	0%	0.00	0.00	ND	ND	ug/L
1,2-Dichloroethane	6	0	0%	0.00	0.00	ND	ND	ug/L
2-Butanone	6	0	0%	0.00	0.00	ND	ND	ug/L
1,1,1-Trichloroethane	6	0	0%	0.00	0.00	ND	ND	ug/L
Carbon Tetrachloride	6	1	17%	1.00	1.00	1.00	12.05	ug/L
Bromodichloromethane	6	0	0%	0.00	0.00	ND	ND	ug/L
1,2-Dichloropropane	6	0	0%	0.00	0.00	ND	ND	ug/L
cis-1,3-Dichloropropene	6	0	0%	0.00	0.00	ND	ND	ug/L
Trichloroethene	6	0	0%	0.00	0.00	ND	ND	ug/L
Dibromochloromethane	6	0	0%	0.00	0.00	ND	ND	ug/L
1,1,2-Trichloroethane	6	0	0%	0.00	0.00	ND	ND	ug/L
Benzene	6	1	17%	2.00	2.00	2.00	6.89	ug/L
Trans-1,3-Dichloropropene	6	0	0%	0.00	0.00	ND	ND	ug/L
Bromoform	6	0	0%	0.00	0.00	ND	ND	ug/L
4-Methyl-2-Pentanone	6	0	0%	0.00	0.00	ND	ND	ug/L
2-Hexanone	6	0	0%	0.00	0.00	ND	ND	ug/L
Tetrachloroethene	6	0	0%	0.00	0.00	ND	ND	ug/L
1,1,2,2-Tetrachloroethane	6	0	0%	0.00	0.00	ND	ND	ug/L
Toluene	6	4	67%	4.00	9.00	ND	7.84	ug/L
Chlorobenzene	6	0	0%	0.00	0.00	ND	ND	ug/L
Ethylbenzene	6	1	17%	2.00	2.00	2.00	6.89	ug/L
Styrene	6	0	0%	0.00	0.00	ND	ND	ug/L
Xylenes (total)	6	4	67%	4.00	15.00	10.25	17.89	ug/L

ND = Compound was Not Detected

Table 20
SURFACE WATER SVOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Napthalene	6	0	0%	0.00	0.00	ND	ND	ug/L
Acenaphthylene	6	0	0%	0.00	0.00	ND	ND	ug/L
Acenaphthene	6	0	0%	0.00	0.00	ND	ND	ug/L
Fluorene	6	0	0%	0.00	0.00	ND	ND	ug/L
Phenanthrene	6	0	0%	0.00	0.00	ND	ND	ug/L
Anthracene	6	0	0%	0.00	0.00	ND	ND	ug/L
Fluoranthene	6	0	0%	0.00	0.00	ND	ND	ug/L
Pyrene	6	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(a)anthracene	6	0	0%	0.00	0.00	ND	ND	ug/L
Chrysene	6	0	0%	0.00	0.00	ND	ND	ug/L
bis(2-Ethylhexy)phthalate	6	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(b)fluoranthene	6	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(k)fluoranthene	6	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(a)pyrene	6	0	0%	0.00	0.00	ND	ND	ug/L
Indeno(1,2,3-cd)pyrene	6	0	0%	0.00	0.00	ND	ND	ug/L
Dibenzo(a,h)anthracene	6	0	0%	0.00	0.00	ND	ND	ug/L
Benzo(g,h,i)perylene	6	0	0%	0.00	0.00	ND	ND	ug/L

ND = Compound was Not Detected

Table 21
SEDIMENT INORGANIC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter Units	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Site Specific Background Concentrations	Positive Detection Exceeding Background	Detection Frequency Exceeding Background	Mean	UCL 95%
Cyanide mg/kg	7	4	57%	0.32	0.66	0.49	1	14%	0.48	0.64
Aluminum mg/kg	7	7	100%	9030.00	15300.00	25958.00	0	0%	12347.14	14345.67
Antimony mg/kg	7	6	86%	0.68	1.30	0.45	6	86%	0.90	1.62
Arsenic mg/kg	7	7	100%	8.90	12.60	13.64	0	0%	10.39	11.36
Barium mg/kg	7	7	100%	153.00	217.00	127.00	7	100%	180.57	199.32
Beryllium mg/kg	7	7	100%	0.62	0.93	1.20	0	0%	0.79	0.88
Cadmium mg/kg	7	7	100%	2.30	4.60	1.65	7	100%	3.61	4.54
Calcium mg/kg	7	7	100%	34400.00	61300.00	62131.00	0	0%	50442.86	58490.73
Chromium mg/kg	7	7	100%	48.60	120.00	37.80	7	100%	73.20	95.74
Cobalt mg/kg	7	7	100%	6.60	11.60	16.90	0	0%	9.19	10.67
Copper mg/kg	7	7	100%	89.00	151.00	30.60	7	100%	115.29	113.34
Iron mg/kg	7	7	100%	19300.00	32600.00	34014.00	0	0%	26785.71	30856.47
Lead mg/kg	7	7	100%	192.00	625.00	59.80	7	100%	285.00	415.42
Magnesium mg/kg	7	7	100%	10900.00	18000.00	15014.00	2	29%	13928.57	16142.41
Manganese mg/kg	7	7	100%	285.00	676.00	429.00	6	86%	556.43	728.62
Mercury mg/kg	7	7	100%	0.38	8.90	0.25	7	100%	1.86	9.29
Nickel mg/kg	7	7	100%	26.90	36.60	50.90	0	0%	30.93	33.22

Potassium mg/kg	7	7	100%	1850.00	3470.00	6757.00	0	0%	2611.43	3306.28
Selenium mg/kg	7	7	100%	1.30	2.40	1.64	3	43%	1.63	1.95
Silver mg/kg	7	7	100%	1.00	2.90	0.14	7	100%	1.63	2.37
Sodium mg/kg	7	7	100%	817.00	2170.00	504.00	7	100%	1239.29	1659.97
Thallium mg/kg	7	0	0%	0.00	0.00	0.75	0	0%	ND	0.51
Vanadium mg/kg	7	7	100%	29.70	46.20	53.80	0	0%	37.17	41.62
Zinc mg/kg	7	7	100%	457.00	685.00	116.00	7	100%	582.57	664.98

ND = Compound was Not Detected

Table 22
SEDIMENT VOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Chloromethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Bromomethane	6	0	0%	0.00	0.00	0.00	ND	ug/kg
Vinyl Chloride	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Chloroethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Methylene Chloride	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Acetone	6	4	67%	34.00	92.00	52.75	114.63	ug/kg
Carbon Disulfide	6	0	0%	0.00	0.00	ND	15.02	ug/kg
1,1-Dichloroethene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
1,1-Dichloroethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
1,2-Dichloroethene (total)	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Chloroform	6	0	0%	0.00	0.00	ND	15.02	ug/kg
1,2-Dichloroethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
2-Butanone	6	0	0%	0.00	0.00	ND	15.02	ug/kg
1,1,1-Trichloroethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Carbon Tetrachloride	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Bromodichloromethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
1,2-Dichloropropane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
cis-1,3-Dichloropropene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Trichloroethene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Dibromochloromethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
1,1,2-Trichloroethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Benzene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Trans-1,3-Dichloropropene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Bromoform	6	0	0%	0.00	0.00	ND	15.02	ug/kg
4-Methyl-2-Pentanone	6	0	0%	0.00	0.00	ND	15.02	ug/kg
2-Hexanone	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Tetrachloroethene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Toluene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
1,1,2,2-Tetrachloroethane	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Chlorobenzene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Ethylbenzene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Styrene	6	0	0%	0.00	0.00	ND	15.02	ug/kg
Xylenes (total)	6	1	17%	10.00	10.00	10.00	15.54	ug/kg

NL = MDNR Residential Cleanup Criteria for Direct Contact was Not Listed
ND = Compound was Not Detected

Table 23
SEDIMENT SVOC/PNA ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Naphthalene	7	0	0%	0.00	0.00	ND	553.04	ug/kg
Acenaphthylene	7	1	14%	91.00	91.00	91.00	802.26	ug/kg
Acenaphthene	7	0	0%	0.00	0.00	ND	553.04	ug/kg
Fluorene	7	4	57%	100.00	150.00	130.00	493.14	ug/kg
Phenanthrene	6	6	100%	520.00	1300.00	928.33	1292.72	ug/kg
Anthracene	6	6	100%	110.00	240.00	175.00	228.28	ug/kg
Carbazole	6	6	100%	100.00	200.00	140.00	175.63	ug/kg
Fluoranthene	7	7	100%	1300.00	2900.00	1985.71	2561.27	ug/kg
Pyrene	7	7	100%	1000.00	3200.00	2171.43	3504.03	ug/kg
Butylbenzylphthalate	6	6	100%	130.00	280.00	210.00	293.70	ug/kg
Benzo(a)anthracene	7	7	100%	370.00	1200.00	762.86	1093.90	ug/kg
Chrysene	6	6	100%	710.00	1500.00	1095.00	1438.63	ug/kg
bis(2-Ethylhexy)phthalate	6	6	100%	2000.00	4000.00	2866.67	3798.67	ug/kg
Di-n-octylphthalate	6	6	100%	200.00	560.00	360.00	594.06	ug/kg
Benzo(b)fluoranthene	6	6	100%	490.00	1800.00	1273.33	2341.84	ug/kg
Benzo(k)fluoranthene	6	6	100%	610.00	2000.00	1195.00	1865.51	ug/kg
Benzo(a)pyrene	7	7	100%	490.00	920.00	727.14	811.40	ug/kg
lndeno(1,2,3-cd)pyrene	7	7	100%	200.00	640.00	415.71	675.37	ug/kg
Dibenzo(a,h)anthracene	7	7	100%	48.00	260.00	165.43	329.43	ug/kg
Benzo(g,h.i)perylene	7	7	100%	110.00	300.00	201.43	285.63	ug/kg

NL = MDNR Residential Cleanup Criteria for Direct Contact was Not Listed
ND = Compound was Not Detected

Table 24
BASEMENT SUMP WATER INORGANIC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Cyanide	8	3	38%	8.10	5150	313.30	416141.05	ug/L
Aluminum	8	6	75%	8.10	6170	5392.06	809795.57	ug/L
Antimony	8	0	0%	0.00	0.0	ND	2.64	ug/L
Arsenic	8	7	88%	1.60	1960	6.01	127.88	ug/L
Barium	8	7	88%	15.70	63.40	44.61	70.71	ug/L
Beryllium	8	0	0%	0.00	0.00	ND	0.08	ug/L
Cadmium	8	2	25%	0.71	11.30	1.04	16.61	ug/L
Calcium	8	8	100%	36700.00	231000	107850.11	224673.46	ug/L
Chromium	8	2	25%	9.50	36.1	6.53	32.00	ug/L
Cobalt	8	7	88%	0.56	11.6	1.95	8.63	ug/L
Copper	8	8	100%	4.40	5740	520.37	114440.23	ug/L
Iron	8	7	88%	1060.00	67500	8009.72	135848.25	ug/L
Lead	8	8	100%	7.90	125	17.35	80.39	ug/L
Magnesium	8	7	88%	5060.00	56200	32238.24	118165.80	ug/L
Manganese	8	7	88%	33.40	632	241.22	2134.05	ug/L
Mercury	8	1	13%	141.00	141	6.80	9689.38	ug/L
Nickel	8	1	13%	906.00	906	48.54	6765.26	ug/L
Potassium	8	7	88%	2480.00	9600	11064.53	410423.43	ug/L
Selenium	8	2	25%	4.40	14.1	3.37	8.00	ug/L
Silver	8	2	25%	0.54	2.40	0.51	1.24	ug/L
Sodium	8	7	88%	11700.00	2300000	198463.12	4244492.12	ug/L
Vanadium	8	8	100%	0.98	16.4	5.01	15.24	ug/L
Zinc	8	1	13%	26500.00	26500	1296.38	1783618.81	ug/L

ND = Compound was Not Detected

Table 25
BASEMENT SUMP WATER VOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Chloromethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
Bromomethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
Vinyl Chloride	6	0	0%	0.00	0.00	ND	12.29	ug/L
Chloroethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
Methylene Chloride	6	0	0%	0.00	0.00	ND	12.29	ug/L
Acetone	6	0	0%	0.00	0.00	ND	12.29	ug/L
Carbon Disulfide	6	1	17%	0.60	0.60	0.60	13.51	ug/L
1,1-Dichloroethene	6	0	0%	0.00	0.00	ND	12.29	ug/L
1,1-Dichloroethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
1,2-Dichloroethene (total)	6	0	0%	0.00	0.00	ND	12.29	ug/L
Chloroform	6	0	0%	0.00	0.00	ND	12.29	ug/L
1,2-Dichloroethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
2-Butanone	6	0	0%	0.00	0.00	ND	12.29	ug/L
1,1,1-Trichloroethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
Carbon Tetrachloride	6	0	0%	0.00	0.00	ND	12.29	ug/L
Bromodichloromethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
1,2-Dichloropropane	6	0	0%	0.00	0.00	ND	12.29	ug/L
cis-1,3-Dichloropropene	6	0	0%	0.00	0.00	ND	12.29	ug/L
Trichloroethene	6	0	0%	0.00	0.00	ND	12.29	ug/L
Dibromochloromethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
1,1,2-Trichloroethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
Benzene	6	0	0%	0.00	0.00	ND	12.29	ug/L
Trans-1,3-Dichloropropene	6	0	0%	0.00	0.00	ND	12.29	ug/L
Bromoform	6	0	0%	0.00	0.00	ND	12.29	ug/L
4-Methyl-2-Pentanone	6	0	0%	0.00	0.00	ND	12.29	ug/L
2-Hexanone	6	0	0%	0.00	0.00	ND	12.29	ug/L
Tetrachloroethene	6	0	0%	0.00	0.00	ND	12.29	ug/L
1,1,2,2-Tetrachloroethane	6	0	0%	0.00	0.00	ND	12.29	ug/L
Toluene	6	0	0%	0.00	0.00	ND	12.29	ug/L
Chlorobenzene	6	0	0%	0.00	0.00	ND	12.29	ug/L
Ethylbenzene	6	0	0%	0.00	0.00	ND	12.29	ug/L
Styrene	6	0	0%	0.00	0.00	ND	12.29	ug/L
Xylenes (total)	6	0	0%	0.00	0.00	ND	12.29	ug/L

ND = Compound was Not Detected

Table 26
BASEMENT SUMP WATER SVOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Napthalene	8	0	0%	0.00	0.0	ND	33.31	ug/L
Acenaphthylene	8	0	0%	0.00	0.0	ND	2202	ug/L
Acenaphthene	8	0	0%	0.00	0.0	ND	2202	ug/L
Fluorene	8	0	0%	0.00	0.0	ND	2202	ug/L
Phenanthrene	8	1	13%	17.00	17.0	13.99	19.10	ug/L
Fluoranthene	8	0	0%	0.00	0.0	ND	2202	ug/L
Pyrene	8	0	0%	0.00	0.0	ND	2202	ug/L
Benzo(a)anthracene	8	0	0%	0.00	0.0	ND	2202	ug/L
bis(2-Ethylhexy)phthalate	8	1	13%	140.00	140	121.72	144.96	ug/L
Benzo(b)fluoranthene	8	0	0%	0.00	0.0	ND	2202	ug/L
Benzo(k)fluoranthene	8	0	0%	0.00	0.0	ND	2202	ug/L
Benzo(a)pyrene	8	0	0%	0.00	0.0	ND	2202	ug/L
lndeno(1,2,3-cd)pyrene	8	0	0%	0.00	0.0	ND	2202	ug/L
Dibenzo(a,h)anthracene	8	0	0%	0.00	0.0	ND	2202	ug/L
Benzo(g.h,i)perylene	8	0	0%	0.00	0.0	ND	2202	ug/L
4-Methylphenol	8	2	25%	13.00	13.00	13.00	N/A	ug/L
Phenol	8	1	13%	110.00	110.0	105.12	110	ug/L
2,4-Dimethylphenol	8	1	13%	26.00	26	20.26	40.7	ug/L
Di-n-butylphthalate	8	1	13%	3.00	3.0	374.61	448504	ug/L
Butylbenzylphthalate	8	2	25%	12.00	15.0	13.58	15.25	ug/L
Di-n-octylphthalate	8	1	13%	78.00	78	89.69	102.04	ug/L
Diethylphthalate	8	1	13%	12.00	12.00	106.58	1565	ug/L

ND = Compound was Not Detected

Table 27
BASEMENT SEDIMENT INORGANIC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter Units	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Site Specific Background Concentrations	Positive Detections Exceeding Background	Detection Frequency Exceeding Background	Mean	UCL 95%
Cyanide mg/kg	4	2	50%	0.61	0.74	0.49	2	50%	0.47	3.52
Aluminum mg/kg	4	4	100%	8520.00	12500	25958.00	0	0%	10761.69	13944
Antimony mg/kg	3	2	67%	0.68	6.50	0.45	2	67%	5.09	65826296990130
Arsenic mg/kg	4	4	100%	5.50	6.70	13.64	0	0%	6.06	6.87
Barium mg/kg	4	4	100%	84.20	117.00	127.00	1	25%	115.57	202.54
Beryllium mg/kg	4	4	100%	0.26	0.61	1.20	0	0%	0.44	0.87
Cadmium mg/kg	4	4	100%	0.45	5.80	1.65	2	50%	3.05	186.90
Calcium mg/kg	4	4	100%	25200.00	99200	62131.00	3	75%	76323.53	345200.64
Chromium mg/kg	4	4	100%	16.10	68.10	37.80	1	25%	33.75	153.46
Cobalt mg/kg	4	4	100%	5.80	9.50	16.90	0	0%	7.01	9.67
Copper mg/kg	4	4	100%	21.70	1180	30.60	3	75%	686.48	12011630.49
Iron mg/kg	4	4	100%	18800.00	32000	34014.00	0	0%	24588.85	33562.86
Lead mg/kg	4	4	100%	22.00	1570	59.80	3	75%	923.84	19864780.73
Magnesium mg/kg	4	4	100%	3340.00	7590	15014.00	0	0%	5929.23	11423.57
Manganese mg/kg	4	4	100%	1200.00	1420	429.00	4	100%	1291.03	1431.54
Mercury mg/kg	4	3	75%	0.17	1.10	0.25	1	25%	0.43	33.40
Nickel mg/kg	4	4	100%	16.10	243	50.90	1	25%	83.54	10018.33

Potassium mg/kg	4	4	100%	1030.00	2230	6757.00	0	0%	1728.31	2925.68
Selenium mg/kg	4	1	25%	1.10	1.10	164	0	0%	0.52	3.22
Silver mg/kg	4	4	100%	0.32	1.10	0.14	4	100%	0.63	2.61
Sodium mg/kg	4	4	100%	245.00	859.00	504.00	2	50%	544.56	1620.68
Thallium mg/kg	4	0	0%	0.00	0.00	0.75	0	0%	ND	0.32
Vanadium mg/kg	4	4	100%	11.50	25.10	53.80	0	0%	21.04	40.90
Zinc mg/kg	4	4	100%	79.20	1210	116.00	3	75%	910.41	190279.68

ND = Compound was Not Detected

Table 28
BASEMENT SEDIMENT VOC ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Chloromethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Bromomethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Vinyl Chloride	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Chloroethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Methylene Chloride	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Acetone	1	1	100%	14.00	14.00	14.00	N/A	ug/kg
Carbon Disulfide	1	0	0%	0.00	0.00	ND	N/A	ug/kg
1,1-Dichloroethene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
1,1-Dichloroethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
1,1-Dichloroethene (total)	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Chloroform	1	0	0%	0.00	0.00	ND	N/A	ug/kg
1,2-Dichloroethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
2-ButaNDne	1	0	0%	0.00	0.00	ND	N/A	ug/kg
1,1,1-Trichloroethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Carbon Tetrachloride	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Bromodichloromethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
1,2-Dichloropropane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
cis-1,3-Dichloropropene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Trichloroethene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Dibromochloromethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
1,1,2-Trichloroethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Benzene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Trans-1,3-Dichloropropene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Bromoform	1	0	0%	0.00	0.00	ND	N/A	ug/kg
4-Methyl-2-Pentanone	1	0	0%	0.00	0.00	ND	N/A	ug/kg
2-Hexanone	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Tetrachloroethene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Toluene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
1,1,2,2-Tetrachloroethane	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Chlorobenzene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Ethylbenzene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Styrene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Xylenes (total)	1	0	0%	0.00	0.00	ND	N/A	ug/kg

NL = MDNR Residential Cleanup Criteria for Direct Contact was Not Liste
ND = Compound was Not Detected

Table 29
TABLE 4-30
BASEMENT SEDIMENT SVOC/PNA ANALYTICAL RESULTS
LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MI

Parameter	Total Analyses	Positive Detections	Detection Frequency	Minimum Detected Value	Maximum Detected Value	Mean	UCL 95%	Units
Napthalene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Acenaphthylene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Acenaphthene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Fluorene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Phenanthrene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Anthracene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Carbazole	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Fluoranthene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Pyrene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Butylbenzylphthalate	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Benzo(a)anthracene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Chrysene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
bis(2-Ethylhexy)phthalate	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Di-n-octylphthalate	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Benzo(b)fluoranthene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Benzo(k)fluoranthene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Benzo(a)pyrene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
lndeno(l,2,3-cd)pyrene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Dibenzo(a,h)anthracene	1	0	0%	0.00	0.00	ND	N/A	ug/kg
Benzo(g,h,i)perylene	1	0	0%	0.00	0.00	ND	N/A	ug/kg

NL = MDNR Residential Cleanup Criteria for Direct Contact was Not Listed
ND = Compound was Not Detected

Table 30
Summary of Risks Associated with Exposures and Major Contributors
Lower Ecorse Creek Dump Site
Wyandotte, Michigan

AREA	EXPOSURE ROUTE	RME, ADULT CANCER RISK	RME, ADULT HAZARD INDEX	CTE ADULT CANCER RISK	CTE ADULT HAZARD INDEX	RME CHILD CANCER RISK	RME CHILD HAZARD INDEX	CTE CHILD CANCER RISK	CTE CHILD HAZARD INDEX	MAJOR CONTRIBUTOR
RESIDENTIAL	Ingestion	1E-6	2E-3	7E-8	3E-4	3E-6	2E-2	9E-7	6E-3	PNAs
SUREACE	Inhalation	1E-11	2E-6	(a)	(a)	1E-11	1E-5	(a)	(a)	
SOILS	Dermal	5E-6	3E-2	1E-7	2E-3	2E-6	5E-2	2E-7	4E-3	PCBs, Mn
	TOTAL	6E-6	3E-2	2E-7	3E-3	5E-6	7E-2	1E-6	9E-3	
RESIDENTIAL	Ingestion	5E-6	4E-3	3E-7	7E-4	1E-5	4E-2	4E-6	1E-2	PNAs, Sb
SUBSURFACE	Inhalation	2E-8	2E-3	(a)	(a)	2E-8	8E-3	(a)	(a)	CS2
SOILS	Dermal	3E-7	4E-3	4E-8	2E-3	2E-8	1E-3	8E-9	5E-4	
	TOTAL	5E-6	1E-2	3E-7	2E-3	1E-5	5E-2	4E-6	1E-2	
HOT-SPOT	Ingestion	--	2E-2	(a)	(a)	--	1E-1	(a)	(a)	CN-
SURFACE	Dermal	--	9E-3	(a)	(a)	--	1E-2	(a)	(a)	
SOILS	TOTAL	--	2E-2	(a)	(a)	--	2E-1	(a)	(a)	
HOT-SPOT	Ingestion	--	2E-1	(a)	(a)	--	2E+0	--	7E-1	CN-
SUBSURFACE	Dermal	--	1E-1	(a)	(a)	--	2E-1	--	2E-2	
SOILS	TOTAL	--	4E-1	(a)	(a)	--	2E+0	--	7E-1	
PARK	Ingestion	6E-6	4E-2	4E-7	7E-3	1E-5	3E-1	5E-6	1E-1	As, PNAS
SURFACE	Inhalation	8E-9	2E-3	(a)	(a)	9E-9	8E-3	(a)	(a)	CS2
SOILS	Dermal	5E-6	3E-2	2E-7	3E-3	2E-5	6E-1	2E-7	5E-3	As, PCBs
	TOTAL	1E-5	7E-2	6E-7	1E-2	3E-5	9E-1	5E-6	1E-1	
SURFACE	Ingestion	7E-8	3E-3	(a)	(a)	8E-8	1E-2	(a)	(a)	As, Mn
WATER	Dermal	1E-8	6E-4	(a)	(a)	7E-9	1E-3	(a)	(a)	As, Mn, CC14
	TOTAL	8E-8	3E-3	(a)	(a)	8E-8	1E-2	(a)	(a)	
SEDIMENTS	Ingestion	1E-7	2E-5	(a)	(a)	3E-7	2E-4	(a)	(a)	PNAs, Hg
	Dermal	5E-9	2E-4	(a)	(a)	2E-9	2E-9	(a)	(a)	
	TOTAL	1E-7	2E-4	(a)	(a)	3E-7	2E-4	(a)	(a)	PNAs
SUMP WATER	Dermal	1E-8	9E-6	(a)	(a)	NOT EVALUATED	NOT EVALUATED	NOT EVALUATED	NOT EVALUATED	
SUMP SEDIMENTS	Dermal	8E-9	3E-9	(a)	(a)	NOT EVALUATED	NOT EVALUATED	NOT EVALUATED	NOT EVALUATED	
	TOTAL	2E-8	3E-3	(a)	(a)	NOT EVALUATED	NOT EVALUATED	NOT EVALUATED	NOT EVALUATED	

(a) CIF exposure scenario was not evaluated because RME exposure scenario risks/hazard indices were below NCP range of 1x10-4 to 1x10-6 or below 1.

Table 31
COCs Detected in Soils
Lower Ecorse Creek Site FS

Chemical	Maximum Concentration Detected (ug/kg)	PRG (ug/kg)	Target Method Detection Limit (ug/kg)
Indeno(1,2,3-cd)pyrene	19000	1.40E+04	330
Benzo (a) pyrene	6400	1.40E+03	330
Dibenzo (a,b) anthracene	3800	1.40E+03	330
Benzo (g,h,i) perytene	8000	1.50E+06	330
Benzo (b&k) fluoranthene	15000	1.40E+04	330
1,4-Dichlorobenzene	14	1.10E+05	10
2-Methylphenol	87	5.50E+06	10
2,4-Dimethylphenol	170	2.10E+07	330
Pentachlorophenol	930	8.20E+04	3,400
PCBS			
Arochlor-1254	250	2.30E+03	330
Arochlor-1260	48	2.30E+03	330
Dioxins			
OCDD	16	9.00E-02	0.001
Inorganics			
Aluminum	1.92E+07	ID	700
Antimony	7.00E+03	1.50E+05	500
Arsenic	3.09E+04	1.37E+04	100
Barium	1.16E+03	3.00E+07	1000
Beryllium	1.30E+03	2.30E+03	200
Cadmium	2.12E+04	2.10E+05	2.10E+05
Calcium	1.15E+08	NA	NL
Chromium	6.76E+05	2.00E+06	200
Cobalt	1.81E+04	2.10E+06	500
Copper	1.51E+06	1.60E+07	1.60E+07
Cyanide	3.23E+07	1.00E+06	500
Iron	1.14E+08	ID	2000
Lead	4.51E+06	4.00E+05	1000
Magnesium	5.97E+06	1.00E+09	3000
Manganese	1.50E+07	2.00E+06	2000
Mercury	8.80E+00	1.30E+05	100
Nickel	1.56E+05	3.20E+07	1000
Potassium	5.10E+06	NA	NL
Selenium	6.10E+03	2.10E+06	500
Silver	1.27E+04	2.00E+06	500
Sodium	9.81E+05	1.00E+09	NA
Thallium	1.40E+03	2.80E+04	500
Vanadium	1.89E+05	3.70E+06	1000
Zinc	5.65E+06	1.40E+08	1000

Bold type indicate compounds exceeding the compound-specific MDEQ Direct Contact Value
Cleanup Criteria, is based on MDEQ Interim Environmental Response Division Operational Memorandum #8.
Revision 4: Generic Residential Cleanup Criteria or Calculated Background

Table 32
for COCs Detected in Soils
Lower Ecorse Creek Site FS

Chemical	Maximum Concentration Detected (ug/kg)	PRG (ug/kg)	Target Method Detection Limit (ug/kg)
VOCs			
Methylene chloride	260	3.40E+05	10
Acetone	1300	1.10E+07	100
Carbon disulfide	65000	1.20E+07	100
2-Butanone	190	2.00E+09	100
1,1,1-Trichloroethane	3	3.10E+06	10
Trichloroethene	3	1.60E+05	10
1,1,2-Trichloroethane	6	4.50E+04	10
Toluene	15	2.40E+07	10
Chloroform	2	4.20E+05	10
Benzene	26	8.80E+04	10
1,1,2,2-Tetrachloroethane	10	1.30E+04	10
Ethylbenzene	11	1.10E+07	10
Styrene	94	8.50E+04	10
Xylene	21	2.00E+08	30
SVOCs			
Phenol	2200	6.60E+07	330
4-Methylphenol	87	2.10E+06	330
N-Nitroso-Di-n-Propylamine	320	3.70E+02	330
Naphthalene	14000	1.50E+07	330
2-Methylnapthalene	9600	ID	330
Dimethylphthalate	450	1.00E+09	330
Acenaphthylene	2500	1.50E+06	330
Acenaphthene	2700	7.60E+07	330
Dibenzofuran	11000	ID	330
Diethylphthalate	590	3.20E+09	330
Fluorene	17000	5.10E+07	330
N-Nitrosodiphenylamine (1)	5000	5.20E+05	330
Hexachlorobenzene	27	6.20E+03	330
Phenanthrene	94000	1.50E+06	330
Anthracene	23000	4.20E+08	330
Carbazole	9000	NL	NL
Di-n-butylphthalate	1300	5.10E+07	330
Fluoranthene	150000	5.10E+07	330
Pyrene	120000	3.20E+07	330
Butylbenzylphthalate	2900	6.80E+07	330
Benzo (a) anthracene	60,000	1.40E+04	330
Chrysene	84000	1.40E+06	330
bis(2-Ethylhexyl)phthalate	77000	7.00E+05	330
Di-n-octylphthalate	21	7.60E+06	330
Benzo (b) fluoranthene	72000	1.40E+04	330
Benzo (k) fluoranthene	3900	1.40E+05	330

Table 33
Soil Cleanup Levels

Chemical	Maximum Concentration Detected (ug/kg)	Cleanup Level (ug/kg)
Indeno(1,2,3-cd)Pyrene	19,000	14,000
Benzo(a)pyrene	6,400	1,400
Dibenzo(a,h)anthracene	3,800	1,400
Benzo(b)fluoranthene	72,000	14,000
Arsenic	30,900	13,600
Cyanide	3.23E+07	1.00E+06
Lead	4.51E+06	4.00E+05
Benzo(a)anthracene	60,000	14,000

12.0 RESPONSIVENESS SUMMARY

The public participation requirements of CERCLA sections 113 (k) (2) (I-v) and 117 of CERCLA have been met during the remedy selection process. Section 113(k)(2)(B)(iv) and 117(b) of CERCLA requires the EPA to respond "...to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan for a remedial action. The Responsiveness Summary addresses concerns expressed by the public, potentially responsible parties (PRPs),,and governmental bodies in written and oral comments received by EPA and the State regarding the proposed remedy for the Lower Ecorse Creek Site.

Background

U.S. EPA issued a fact sheet to the public in December, 1993, at the beginning of the Remedial Investigation. The Agency also hosted a public meeting on January 13, 1994, to provide background information on the Lower Ecorse Creek site, explain the Superfund process, and provide details of the upcoming investigation. The remedial investigation was completed in February 1996, and 'in February, 1996, U.S. EPA issued a second fact sheet to summarize the results of the investigation.

The RI/FS reports and the Proposed Plan for the Lower Ecorse Creek site were released to the public for review in April 1996. Information repositories have been established at the following location: Bacon Memorial Library, 45 Vinewood Avenue, Wyandotte, Michigan, 48192. The Administrative Record has been made available to the public at the U.S. EPA Docket Room in Region V and at the information repository.

A public meeting was held on May 9, 1996, to discuss the FS and the Proposed Plan. At this meeting, representatives from the U.S. EPA and the Michigan Department of Environmental Quality answered questions about the Site and the remedial alternatives under consideration. Formal oral comments on the Proposed Plan were documented by a court reporter. A verbatim transcript of this public meeting has been placed in the information repositories and Administrative Record. Written comments were also accepted at this meeting. The meeting was attended by approximately 50 persons, including local residents and PRPs.

The FS and Proposed Plan were available for public comment from April 3 0, 1996 through May 29, 1996. Comments received during the public comment period and the U.S. EPA's responses to those comments are included in the attached Responsiveness Summary, which is a part of this ROD. Advertisements announcing the availability of the Proposed Plan, start of the comment period were published in the News Herald and Detroit News newspapers on May 5, 1996. A correction was subsequently published in the Detroit Freepress and Detroit New on May 8 and 9, 1996, the New Herald on May 5, 1996, and in the Heritage newspaper on June 1, 1996, to correct the date of the public meeting.

During the comment period, EPA received approximately 5 written submittals of comments and 5 oral comments concerning the proposed plan.

Summary of Significant Comments

Comment 1: One commenter stated that they strongly recommend Alternative 3 since it is the most effective; it would remove ail contaminated soil and is the least costly. They also stated that Alternative 2 is not preferred because it would not remove deep contaminated soil, and the application of deed restrictions to the property would be "disasterous". They further requested that the additional sampling and excavation at the Oak Street location be scheduled for the month of August when the restaurant that uses the lot for customer parking is closed..

Response 1: U.S. EPA acknowledges the comment. The Agency will work with the owner of the Oak Street property and the management of the restaurant that uses the parking lot to try to accomodate their schedule as best we can.

Comment 2: One commenter stated that they definitely agree with the recommendation for Alternative 3 because it is the only way for the neighborhood to get rid of the stigma associated with the contamination. They additionally stated that the cleanup should begin immediately. They did not understand why they would have to wait until next year, and why their property needs to be sampled again.

Response 2: U.S. EPA acknowledges the comment. We are constantly working to expedite cleanups at Superfund sites. One of the things done at this site to make it move through the process more quickly was to utilize the removal cleanup to gather data which could then be used in the Remedial phase of the project, avoiding having to resample areas to get the appropriate quality of data. We will work throughout this cleanup to streamline the process and complete the project as quickly and efficiently as we can.

However, there are things we are required to complete before we can actually start the excavation project. At this site at least two steps must be taken. First, we must determine who is going to perform the cleanup. Either U.S. EPA will do the work using Superfund Trust Fund money, or the potentially responsible parties will use their own resources to perform the work. U.S. EPA is committed to trying to get those responsible for creating contamination problems to perform the cleanup. If they fail to step up and commit to undertake the action U.S. EPA will be forced to use money from the Superfund Trust Fund to perform the work. In the long run, where there is not an immediate threat to public health or the environment, it is beneficial to everyone to avoid unnecessarily relying on the Trust Fund to pay for the cleanup and having the potentially responsible parties undertake the work. That makes those funds available for projects where there in no private party to step forward to do the work, At this site we intend on approaching the parties to ask them to perform the cleanup. We hope to complete that negotiation process within a couple of months after the ROD is issued. If they refuse, we are prepared to use the Fund monies.

The second step to complete is the design phase of the project. This phase primarily consists of assembling all of the plans for carrying out the cleanup, Including work plans to detail how the excavation will take place, health and safety plans for the workers, sampling plans to help determine when excavations are complete, restoration plans for the properties being affected, to name a few. Documents also need to be assembled to prepare to acquire bids and hire contractors to do the work. This design phase can take at least 6 months to complete and is necessary to ensure that the cleanup is performed properly and will meet specifications. We will take whatever steps we can to expedite this phase of the project, but it is not anticipated that it will be completed before the winter of this year. If that is the case we probably would not begin the excavation until spring because of the frozen condition of the soil which can make excavation extremely difficult. In most cases it would be best to wait for spring so the grounds thaw and working conditions are more acceptable.

The properties need to be resampled so we can more accurately estimate how much soil requires removal. In many instances we only have one sample from one location indicating a potential contamination problem. We need to take more samples around that location to confirm whether there is a contamination problem and to define the extent of that contamination before deciding if action is required.

Comment 3: One commenter stated that as long as there is an EPA presence in the area property values will be subjected to a lower than warranted value. They go on to say that if Alternative 3 were to be implemented and completed the "cloud of doubt" would be removed from the area and property values would again represent actual market values. The health and welfare of the people in the area, as well as the City of Wyandotte would be protected.

Response 3: The comment is acknowledged.

Comment 4: One commenter asked about Ecorse Creek pollution and cleanup in the summer. They stated that the smell coming from the creek in the summer is pretty bad, and to possibly have the high spots in the creek dredged to allow fresh water to flow back up the creek might be beneficial.

They also asked why the contaminated properties are just not bought by the City and developed into a golf course or park, as has been done at other contaminated areas.

Response 4: U.S. EPA has sampled the creek, both upstream and adjacent to the Site, and have found contaminants in the sediments and surface water. However, the same contaminants found adjacent to the Site were found upstream, indicating that the contamination is not from the Site, but is probably from some other source. Therefore, the creek will not be addressed as part of this cleanup effort.

U.S. EPA has made a strong commitment to employing cleanups which are permanent solution to contamination problems. By leaving contamination in place the cost of the remedy would rise because of the costs associated with constructing a soil cover over the contamination, maintaining the cover system, and implementing deed restrictions to ensure no one digs on the property in the future. In addition, leaving the contamination in the middle of a residential area might have a continuing detrimental effect on property values. We believe excavation and off-site disposal is the most cost effective solution to the problem.

Comment 5: One commenter stated that the Army Corps of Engineers ("U.S. ACE")has Jurisdiction waterward of the Ordinary High Water Mark, and in any adjacent wetlands for that portion of the Ecorse River which is east of the Detroit and Toledo Railroad tracks. If the site clean-up may affect the course, capacity, or condition of the Ecorse River Downstream of where the work is occurring, they advise that U.S. EPA contact the U.S. ACE Detroit office prior to commencement of work for possible permit requirements.

Response 5: U.S. EPA will comply with any substative, applicable, or relevant and appropriate permit requirements the U.S. ACE may have for any work occurring on-site, and will obtain all necessary permits for work occurring off-site. We win coordinate with the appropriate office of the U.S. ACE.

Comment 6: One commenter stated that they agree with Alternative 3. They stated that they tried to sell their home and the offer they received came in $33,000 below the estimated value. They would prefer to get rid of the problem and be in the position someday getting back to their normal lives.

Response 6: The comment is acknowledged.

Comment 7: One commenter asked how hazardous is the surface water in the creek? He expressed concern over children consuming the water. He went on to express concern over the contaminants entering the creek via surface water run-off from the site.

Response 7: Surface water run-off of is a potential migration pathway for contaminants from the site. Through the selected cleanup, and off-site disposal of the contaminated soils, the threat of site-related contaminants entering the creek should be nuinimized. It should be noted that the creek had been sampled as part of the Remedial Investigation and it was found that sources other than this Site are probably contributing contamination to the creek. Risks to children exposed to the surface water and sediments from the creek were-evaluated as part of the risk assessment process. No unacceptable risks were found. U.S. EPA defines an unacceptable risk as an increased risk greater than 1 x 10-4 to 1 x 10-6 of an individual getting cancer (or 1 in 10,000 to 1, in 1,000,000). For non-carcinogens it is defined as a Hazard Index greater than 1.0. For children at this site the carcinogenic risk for exposure to surface water and sediments was calculated to be 8 x 10-8 and 3 x 10-7, respectively. The non-carcinogenic risk was 0.001 and 0.0001 for surface water and sediments, respectively.

Comment 8: One commenter asked whether we know exactly which properties will be excavated.

Response 8: At this point we know that 470/80, 471, and the empty lot north of 470/480 will be excavated. The park area will also be excavated. On these properties we have sufficient data to justify the need to excavate. Other properties along North Drive and the property on Oak Street require additional sampling to determine whether excavation is warranted. We anticipated completing that sampling by the end of the fall of 1996.

Comment 9: One commenter asked if work was going to continue on his property on Oak Street while we go through the remedy selection process.

Response 9: The work in question, excavating contaminated soils from underneath the back porch at the residence on Oak Street, was post-poned until the homeowner tore down the porch as he agreed. The commenter has been informed that he should remain in touch with the On-Scene Coordinator to keep them appraised of his schedule so the cleanup can be coordinated.

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UPDATE #1 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

December 20, 1990

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
09/24/90	Weston, Inc.	Bowlus, R., U.S. EPA	Extent of Contamination Study/Photographs	51
11/19/90	Environmental Health Scientist, ATSDR	Jordan-Izaquirre,D., ATSDR	Prussian Blue Extent of Contamination Study, Wayne County	6
Misc.	Bionetics, Inc.	Bowlus, R., U.S. EPA	Aerial Photo Environmental Photographic Interpretations	
			Vol. 1	17
			Vol. 2	8

UPDATE #2 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

February 13, 1991

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
01/23/91	Fenner, F., E & E	File	X-Ray Diffraction Analysis	4

UPDATE #3 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

February 22, 1991

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
02/14/91	Bowlus, B., Keiser, S., U.S. EPA	File	Short Community Relations Plan	2

UPDATE #4 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

April 22, 1991

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
02/22/91	Urda-Thompson, A., TAT	Heaton, D., U.S. EPA	Letter Report Regarding Sampling	19
03/15/91	Hurst, P., U.S. EPA	Bowlus. R., U.S. EPA	Toxicity Infor-mation for Prussian Blue	13
03/28/91	Hurst, P., U.S. EPA	Bowlus, R., U.S. EPA	Review & Summary of Toxicity Information	7

UPDATE #5 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

May 31, 1991

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
07/11/90	Kreindler, C., Doyle, W., Weston	Heaton, D., U.S. EPA	Site Assessment for Prussian Blue	17

UPDATE #6 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

August 27, 1991

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
02/00/88	Harkins, S., Truesdale, R., Hill, R., Research Tri-angle Institute	U.S. EPA	U.S. Production of Manufactured Gases: Assessment of Past Disposal Practices	405
04/00/89	Whiffin, R., Rush, R.J., Spice, I.E.		Journal Article. "Coal Gas Legacy"	12
7-8/00/89	Moore, T.		Journal Article, Managing the Gas-light Legacy	12
10/00/89	McLaughlin, F., Analytic & Biological Labs.	O'Mara, M., Weston Sper	Initial Sampling Results	38
01/00/90	MGP Update		Publication Article, Research Program-Cyanide Compounds in Leachate	7
05/16/90	Hesford. M., PEI Associates	Bowlus, B., U-S. EPA	Analysis of the Waste Material "Prussian Blue"	55

UPDATE #7 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

September 6, 1991

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
08/29/91	Urda-Thompson, A., E & E	Heaton, D., U.S. EPA	Letter Report	15
08/30/91	Urda-Thompson, A., E & E	Heaton, D., U.S. EPA	Letter Report	116

UPDATE #8 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

April 30, 1992

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
04/27/92	Bowlus, R., U.S. EPA	Ullrich, D., U.S. EPA	Action Memorandum- 12 Month Exemption	5

UPDATE #9 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

July 2, 1992

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
06/12/92	Ecology & Environment, Inc.	Heaton, D., U.S. EPA	Field Sampling Plan	51

UPDATE #10 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

October 21, 1992

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
10/08/92	Brown, K., U.S. EPA	Buckley, B., U.S. EPA	Report-"North Drive Specialized Cyanide Analysis"	22

UPDATE #11 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

December 14, 1993

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
07/13/92	Langer, H., E & E	Buckley, R U.S. EPA	Investigation of White Material at 455 North Drive	1
10/20/92	Langer, H., E & E	Heaton, D., U.S. EPA	Letter Report	12
05/27/93	Thrasher, D., E & E	Pfundheller, J., U.S. EPA	Letter Report for December 4, 1992 Sampling Project	70
05/27/93	Thrasher, D., E & E	Pfundheller, J., U.S. EPA	Letter Report for January 7, 1993 Sampling Project	46
05/28/93	Thrasher, D., E & E	Pfundheller, J., U.S. EPA	Letter Report for April 9, 1993 Sampling Project	46
08/13/93	Johnson, B., ATSDR	Adamkus, V., U.S. EPA	Public Health Advisory	22
09/09/93	Heithmar, E., U.S. EPA	Buckley. R., U.S. EPA	North Drive Speci-alized Cyanide Analyses II Report	14
09/24/93	Buckley, R., U.S. EPA	Muno, W., U.S. EPA	Action Memorandum-Ceiling Increase	37
09/30/93	Thrasher, D., E & E	Pfundheller, J., U.S. EPA	Letter Report (Data Summary for 1989-1993)	41

UPDATE #12 TO
ADMINISTRATIVE RECORD INDEX
FOR
NORTH DRIVE SITE
Wyandotte, MI

January 11, 1994

DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
12/15/93	Buckley, R., U.S. EPA	Muno, W., U.S. EPA	Action Memorandum- Ceiling Increase	60

U.S. ENVIRONMENTAL PROTECTION AGENCY
ADMINISTRATIVE RECORD
NORTH DRIVE/LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN
UPDATE #13
05/22/96

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	00/00/00	Michigan Department of Public Health	Public	Informational Bulletin: "Wealth Risks from Cyanide Exposure in the North Drive Area, Wyandotte"	2
2	00/00/00	U.S. EPA	File	Preliminary Results of Testing at the North Drive Site	60
3	02/00/88	Harkins, S., et al.; Research Triangle Institute	U.S. EPA	Technical Report "U.S. Production of Manufactured Gases: Assessment. of Past Disposal Practices"	410
4	04/00/89	Whiffen, R., et al.		Journal Article: "Coal Gas Legacy" (Civil Engineering)	2
5	08/00/89	Electric Power Research Institute		Publication: "Managing the Gaslight Legacy" (EPRI Journal Reprint)	12
6	01/00/90	Gas Research Institute		Article: "Characterization of Cyanide in the Leachates of MGP Site Waste (MGP Update #13)	7
7	02/00/90	U.S. EPA/OERR	U.S. EPA	Quick Reference Fact Sheet: "Real Estate Acquisition Procedures for USACE Projects" (Publication 9355.5-41/FS)	5
8	07/03/91	U.S. EPA/OSWER	U.S. EPA	Memorandus re: Policy Towards Owners of Residential Property at Superfund Sites (OSWER Directive 9834.6)	8
9	01/27/93	U.S. EPA	File	Hazardous Site Control Division: Examples of Residential Sites	6

10	08/13/93	Johnson, B., USDHHS/USPHS/ATSDR	Adaskus, V., U.S. EPA	ATSDR Public Health Advisory for the North Drive Duap Site w/Cover Letter	22
11	09/29/93	Sclabassi, M.	Public	Newspaper Article: "Help Sought: Dingell wants EPA to Move 'Expeditiously' an Cyanide Laced Lots" (News-Herald)	1
12	10/18/93	Johnson, B., USDHHS/USPHS/ATSDR	Ullrich, D., U.S. EPA	Letter re: ATSDA Health Advisory an the North Drive Dump Site w/Attached Chronology	4
13	10/28/93	Prendiville, T., U.S. EPA	File	Telephone Conversation Record w/A. Powdowski (USEPA) re: North Drive Toxicity Tests	1
14	10/23/93	Barna, D., U.S. EPA	Addressees	Memorandum re: Mult-Media Screening Inspection Checklist for BASF Wyandotte	83
15	11/04/93	Bell, J., U.S. EPA	Keidan, T., U.S. EPA	Memorandum re: Site Name Change from North Drive to Lower Ecorse Creek Dump	1
16	11/08/93	Brown, K., U.S. EPA/TSS/EMSL	Prendiville, T., U.S. EPA/Region 5	FAX Transmission Forwarding Attached "North Drive Specialized Cyanide Analyses" Report	24
17	11/09/93	Prendiville, T., U.S. EPA	File	Handwritten Notes re: ECAO Conference Call	2
19	11/09/93	Prendiville, T., U.S. EPA	File	Telephone Conversation Record w/K. Brown (USEPA), et al., re: MAD Analysis	2
19	11/10/93	Prendiville, T., U.S. EPA	File	Handwritten Notes from Conversation w/EMSL Personnel	4
20	11/24/93	U.S. EPA/Region 5 Regional Decision Team	U.S. EPA	RDT Briefing on the Lower Ecorse Creek Dump (North Drive) Site w/Attachments	37

21	12/00/93	Neumann, P.	Public	Newspaper Article: "4 Downriver Sites Rank Among Worst; DNR Targets Contaminated AReas" (News-Herald)	2
22	12/00/93	U.S. EPA/OPA	Public	Superfund Fact Sheet: "North Drive Site"	6
23	12/00/93	Downriver Citizens for a Safe Environment	Public	Two News Reports: "North Drive Cyanide..." and "Wyandotte (Downriver Digest)	1
24	12/05/93	Sclabassi, M.	Public	Newspaper Article: "Cleanup Gets Going on Contaminated Block" (Heritage Sunday)	1
25	12/08/93	U.S. EPA/DERR	U.S. EPA	Nomination Package for an ATSDR Health Advisory Criteria Site for the Lower Ecorse Creek Dump Site	104
26	12/09/93	Clark, J., U.S. EPA	Prendiville T., U.S. EPA	Memorandum re: Derivation of Cyanide Cleanup Levels for the Emergency Action at the North Drive Site	7
27	12/16/93	Ecology and Environment, Inc.	U.S. EPA	Extent of Contamination Sample Plan for the North Drive Site (FINAL DRAFT)	59
28	12/16/93	Nelson, J., U.S. EPA General Counsel	Laskowski, S., U.S. EPA/Region 3	Memorandum re: Legal Authority to Replace Demolished Buildings at Superfund Sites	12
29	12/23/93	Traub, J., U.S EPA	File	Memorandum re: Region 5 Regional Decision Team's Approval for a RI/FS First Start at the North Drive Site	4
30	00/00/94	Thels, T., et al.		Journal Article: "Leachate Characteristics and Composition of Cyanide Bearing Wastes from Manufactured Gas Plants" (Environ,Sci. Technol.)	9

31	01/07/94	Michigan Department of Public Health	Wyandotte Health and Safety Officials	Notice re: Concentrations of Cyanide in the North Drive Area	1
32	01/20/94	Sclabassi, M.	Public	Newspaper Article: "Surface Cyanide Poses Less Risks EPA Issues Precautions to Block Residents" (News-Herald)	1
33	01/21/94	Williams R., USDHHS/USPHS/ATSDR	Muno, W., U.S. EPA	Letter re: Soil Cyanide Action Levels at the North Drive Dump Site	1
34	02/14/94	Ecology and Environment, Inc.	U.S. EPA	Community Relations Plan for the North Drive Site	36
35	02/16/14	Carpenter, G., MDNR	Wyandotte Resident	Letter re: Results of Soil Simple Analysis	2
36	02/23/94	Maughan, D., Battelle Pacific Northwest Libarator-ies	Brown, K., U.S. EPA	FAX Transmission Forwarding Attached February 22, 1994 Memorandum re: Comments on the Quality Assurance Proiect Plan for the North Drive NPL Site Cyanide Characterization; Total, Weak Acid Dissociable, and Bioavailable" Report	4
37	03/71/94	Brown, K., U.S. EPA/ORD	Prendiville, T., U.S. EPA/Region 5	Report: 'Quality Assurance Project Plan for the North Drive NPL Site Cyanide Characterization; Total, Weak Acid Dissociable, and Bioavailable" w/Cover Letter	169
38	04/07/94	Brown, k., U.S. EPA/ORD	Prendiville, T., U.S. EPA/Region 5	Memorandum re: Analytical Results of North Drive Soil Samples	2
39	05/11/94	Prendiville, T., U.S. EPA	File	Telephone Conversatios Record w/P. Guria (USEPA) re: North Drive Removal	1
40	06/02/94	CH2M Hill	U.S. EPA	Health and Safety Plan	43
41	06/08/94	Willians, M.	Public	Newspaper Article: "Test of Endurance: For One Wyandotte Neighborhood, Being a Superfund Site is Inconvenient" (Detroit Free Press)	2

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
42	06/14/94	Prendiville, T., U.S. EPA	File	Telephone Conversation Record Lower Ecorse and Associated Sites	1
43	06/15/94	Brown, K., U.S. EPA/ORD	Prendiville, T., U.S. EPA/Region 5	Memorandum Forwarding Attached North Drive Reports: (1) June 1994 NPL Site Characterization; (2) March 1991 Journal Article; (3) March 1993 Journal Abstract; and (4) May 1994 Results of Sample Analysis	448
44	08/15/94	Prendiville, T., U.S. EPA	File	Telephone Conversation Record w/R. Buckley (USEPA) re: Blue Clay at the Lower Ecorse Dump site	1
45	08/19/94	Clark, J., U.S. EPA	Prendiville, T., U.S. EPA	Memorandum re: New Interim Cyanide Level of Concern for the North Drive Site	1
46	08/25/94	CH2M Hill	U.S. EPA	Work Plan for the RI/FS for the Lower Ecorse Creek Dump Site	120
47	06/29/94	Williams, J., CH2M Hill	Prendiville, T., U.S. EPA	Letter Forwarding Attached Quality Assurance Project Plan, Field Sampling Plan and Health and Safety Plan for the Lower Ecorse Creek Dump Site	335
48	09/15/94	Prendiville, T., U.S. EPA	Wyandotte Residents	Letter re: Citizens Inquiry Concerning Possible Cyanide Contamination	2
49	11/30/94	Kavanaugh, C.	Public	Newspaper Article: "Tests Start Near Superfund Site: EPA Sees if Pollutants Are Gone (News-Herald)	2
50	12/00/94	CH2M Hill	U.S. EPA	Community Relations Plan Addendum for the Lover Ecorse Creek Dump Site	10

51	02/09/95	Brown, K., U.S. EPA/ORD	Prendiville T., U.S. EPA/Region 5	Memorandum Forwarding February 1995 "Determination of Total, Weak Acid Dissociable, and Bioavailable Cyanide in North Drive Soil Samples" Report w/Attached March 24, 1194 Memorandum re: Reanalysis of Samples for Bioavailable Cyanide	174
52	03/08/95	Kavanaugh, C.	Public	Newspaper Articles "Report: Clean Up Site No Hazard (News-Herald)	2
53	03/16/95	Prendiville, T., U.S. EPA	File	Telephone Conversation Record w/K. Brown (USEPA/ENSL) re: EMSL Cyanide Analysis	1
54	03/23/95	Buckley, R., U.S. EPA	Prendiville, T., U.S. EPA; et al.	FAX Transmittal re: Preliminary Sampling and Analysis Data from the Oak Street Site (HANDWRITTEN)	2
55	03/24/95	Prendiville, T., U.S. EPA	File	Telephone Conversation Record W/J. Clark (USEPA) re: Cyanide Contamination	1
56	04/11/95	Prendiville, T., U.S. EPA	File	Handwritten Notes re: use of criteria/available if Data Shows Significant Variability	1
57	D4/27/95	Prendiville, T., U.S. EPA	Ellison, R., U.S. EPA	Memorandum re: Data Concerning the Correlation Between Total Cyanide and Bioavailable Cyanide (HANDWRITTEN)	1
58	05/12/95	Ellison, R. and R. Buckley, U.S. EPA	Addressees	POLREP #2 for the Oak Street Site	3
59	05/22/95	Ellison, R. and R. Buckley, U.S. EPA	Addressees	Report: #3 for the Oak Street Site	3
60	06/00/95	Ottoar, L., Lockheed Environmental Systems & Technolog-ies	U.S. EPA	Report: "Determination of Total, Weak Acid Dissociable and Bioavailable Cyanide in North Drive Oak Street Soil Samples"	107

61	06/21/95	Ellison, R. and R. Buckley, U.S. EPA	Addressees	POLREP #5 for the Oak Street Site	3
62	06/06/95	Ellison, R. and R. Buckley, U.S. EPA	Addressees	POLREP #6 for the Oak Street Site	3
63	06/29/95	Prendiville, T. and D. Novak, U.S. EPA	Residents	Letter re: Information Update on Activities At the North Drive Site	2
64	10/12/95	CH2M Hill	U.S. EPA	Final Remedial Investigation Report (Volumes 1 and 2)	923
65	11/27/95	Ellison , R. and R. Buckley, U.S. EPA	Addressees	POLREP #7 and Final for the Oak Street Site	2
66	11/29/95	USDHHS/USPHS/ATSDR	U.S. EPA	Public Health Assessment for the Lower Ecorse Creek Dump	61
67	01/07/96	Kavanaugh, C.	Public	Newspaper Article: "Final Report Says Health Threat Gone: Federal Cleanup Mitigated Cyanide Contamination" (Heritage Sunday)	2
68	01/31/96	CH2M Hill	U.S. EPA	Feasibility Study Report for the Lower Ecorse Creek Site"	110
69	02/00/96	U.S. EPA/OPA	Public	Fact Sheet: "Remedial Investigation Completed at the Lower Ecorse Creek Superfund Site"	6
70	03/06/96	Prendiville, T., U.S. EPA	Wyandotte Residents	Letter re: Citizen's Inquiry Concerning Property Development	1
71	03/11/96	Prendiville, T., U.S. EPA	Wyandotte Residents	Letter re: Citizen's Inquiry Concerning Property Development	2
72	03/12/96	Kimbrough, D. dnd T. Prendiville, U.S. EPA	Residents	Letter Selecting Comments re: the February 1996 U.S. EPA Fact Sheet and the Remedial Investigation at the Lower Ecorse Creek Site	1

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U.S. ENVIRONMENTAL PROTECTION AGENCY
ADMINISTRATIVE RECORD
NORTH DRIVE/LOWER ECORSE CREEK DUMP SITE
WYANDOTTE, MICHIGAN
UPDATE #14
06/19/96

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	04/00/96	U.S. EPA	Public	Fact Sheet: "Proposed Plan for Remedial Action at the Lower Ecorse Creek Superfund Site"	6
2	05/06/96	Tucker, R., U.S. Army Corps of Engineers/Detroit District	U.S. EPA	Letter re: USACDE's Comments on the Proposed Plan	3
3	05/15/96	Concerned Citizens	U.S. EPA	Four Public Comment Letters re: the Recommended Alternative Presented in the Proposed Plan (PORTIONS OF THIS DOCUMENT HAVE BEEN REDACTED)	4
4	05/23/96	Yarbrough, D., CSR	U.S. EPA	Transcript of May 9, 1996 Proposed Plan/ Public Comment Period Meeting	62
5	06/13/96	Williams, J., CH2M Hill	Prendiville, T., U.S. EPA	FAX Transmission Forwarding June 13, 1996 CH2M Hill Memorandum re: Risk Due to Pet Consumption of Swap Water	5